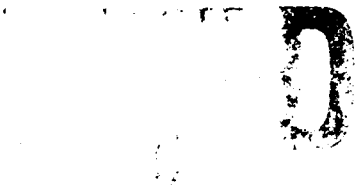

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CORPS LEVEL COMMAND, CONTROL, AND COMMUNICATIONS COUNTERMEASURES (C3CM)

A thesis presented to the faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

KEVIN P. MCGOVERN, MAJOR, USA
B.A., Pepperdine University, Malibu, California, 1978

Fort Leavenworth, Kansas
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This thesis focuses on development of a Command, Control, and, Communications Countermeasures (C3CM) planning architecture for corps level operations. Initially, the research describes previous uses of C3CM in recent wars and reviews the lessons learned with applications to the U.S. Army. The lessons learned from previous wars, provides a basis to analyze the U.S. Army corps level command and staff processes for countering enemy command, control and communications (C3). Included, is an analysis of how C3CM components of maneuver, electronic warfare, targeting, deception and operations security are integrated into a corps level operation. The analysis of the corps planning process assists in the formulation of a C3CM architecture for planning at the corps level that includes the support requirements of intelligence, communications, command and control, and training. The conclusions reached from this thesis develop a C3CM planning architecture that is integrated into the corps planning process.

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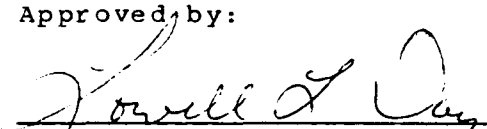

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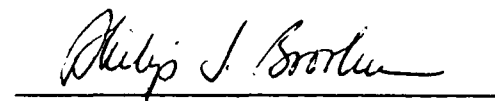

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ABSTRACT

CORPS LEVEL COMMAND, CONTROL, AND COMMUNICATIONS COUNTERMEASURES (C3CM) by MAJ Kevin P. McGovern, USA, 115 pages.

This thesis focuses on development of a Command, Control, and, Communications Countermeasures (C3CM) planning architecture for corps level operations. Initially, the research describes previous uses of C3CM in recent wars and reviews the lessons learned with applications to the U.S. Army. The lessons learned from previous wars, provides a basis to analyze the U.S. Army corps level command and staff processes for countering enemy command, control, and communications (C3). Included, is an analysis of how C3CM components of maneuver, electronic warfare, targeting, deception, and operations security are integrated into a corps level operation. The analysis of the corps planning process assists in the formulation of a C3CM architecture for planning at the corps level that includes the support requirements of intelligence, communications, command and control, and training. The corps C3CM planning architecture developed is integrated into the corps planning process.

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CHAPTER ONE

INTRODUCTION

The world has entered a new era of modern warfare in which technology dominates the battlefield. Command, Control, and Communications Countermeasures (C3CM) is part of a new type of technological warfare that is developing at a rapid pace. C3CM is one of the critical activities that will enhance and maximize future warfare and technology. C3CM operations could become so critical to military operations in the future that, if the enemy's command control and communications (C3) can be disrupted, battles can be won before they begin. In effect C3CM, attempts to paralyze the main body of the enemy by eliminating his central nervous system. Future battles may well be decided by who wins the initial command, control, communications and intelligence (C3I) versus C3CM skirmish.[1]

PURPOSE

C3CM has proven its importance in recent conflicts at the operational and theater level of war, but the U.S. Army has yet to take advantage of this activity within the corps structure. Great efforts have been made to perfect command, control and communications countermeasures at the operational and strategic

level; however, tactical C3CM at corps level needs attention. The primary focus of this thesis will be to investigate the need for a doctrinal planning architecture for C3CM within a corps headquarters, that will synchronize the elements of C3CM into an overall operation. The synchronized Corps planning and execution of C3CM will produce decisive results in future conflicts. The C3CM planning architecture produced will develop within the framework of current and future US Army Airland Battle concepts.

The objective of this research is to examine the Army's current corps level C3CM process and make recommendations toward improving the planning and execution of C3CM operations. This research is relevant to current military thought because it is a major factor in the current U.S. Army doctrine in FM 100-5. Questions to be considered in the research are: Does the U. S. Army need a structure for the planning and execution of C3CM? What is C3CM and how does it apply to the Airland battle of the future? If the Army does need a C3CM planning structure what should it look like? How do we integrate maneuver, deception, targeting, operations security into an overall C3CM plan in offensive and defensive operations? What are the requirements of C3CM operations? Will the Army be able to manage the developing C3CM requirements? What are the future implications for C3CM?

SIGNIFICANCE

The subject of C3CM has taken on a new importance due to

the recent Iraq War of February 1991. The targeting of enemy command, control, and communications and the protection of friendly systems took on significant importance during the conflict. The U.S. Army is currently developing new doctrine called Airland Battle Future (ALBF) in which it will apply the lessons from the recent war. The synchronization of C3CM activities, at the corps tactical level, is lacking a structure for planning and execution. C3CM, how it is planned and executed, is a subject that needs in depth research. This research will focus on C3CM as an important area that has long been overlooked. Research will also focus on the "how" of C3CM. Much has been written on what C3CM is and why it is important, but the planning and execution need further development. This paper will lay some of the ground work and provide some insight into the future of C3CM strategy within the corps planning system.

ASSUMPTIONS

In order to properly develop the subject of C3CM, the following assumptions have been made based on initial research. There currently is no standard or model C3CM structure available for Army planners to follow. C3CM will remain an important activity for future Airland battle operations. C3CM activity involves primarily maneuver, targeting, deception and operations security, but it is also a constantly evolving concept. The synchronized activities of C3CM, can produce decisive effects on the battlefield.

LIMITATIONS AND DELIMITATIONS

The following limitations and delimitations have been used to focus research on the subject of C3CM. Limitations: Although C3CM type activities are not new to combat operations, C3CM as an integrated activity in warfare is new. Research efforts on gathering information on the subject will be limited to developments after the Vietnam War. Delimitations: Research of C3CM focus at the planning of tactical C3CM for a corps size unit since the subject of C3CM is broad and complex

METHODOLOGY

The research will be conducted using the descriptive methodology, which is to make inquiries about specific aspects of the subject.[2] Since C3CM is a complex and developing concept in the Army, the research will initially focus on understanding the C3CM problem. The initial description of C3CM, in chapter two, will help the reader to understand the subsequent areas concerning C3CM. Chapter three will describe how C3CM has been used in previous conflicts and review the lessons learned with applications to the U.S. Army. Chapter four will describe U.S. Army corps level command and staff processes for countering enemy command, control and communications (C3) and for protecting friendly forces C3. This chapter will also analyze the maneuver, electronic warfare, targeting, deception and operations security processes at the corps level. The analysis conducted in this chapter will help in the formulation of a structure for planning and execution of

C3CM at the corps level that can be placed over the existing organization. Chapter five will review the staff organizations and responsibilities of each that relate to the planning and execution of C3CM. Chapter five will also explore intelligence and training requirements for C3CM operations. Finally, an analysis and conclusions reached from the research will be presented.

REVIEW OF LITERATURE

C3CM as an integrated battlefield activity, has only recently become a subject of importance. Most of the material written on C3CM is available from two types of sources: periodicals and service field manuals. Service field manuals and other official publications will be used as a starting point to define C3CM and current Army thought on the subject. Research will use articles from periodicals as supporting evidence.

Available literature research is confined to the specific components or supporting elements of C3CM. The key subject areas related to research of C3CM are maneuver, targeting, electronic warfare, deception, operations security, intelligence, and communications support. The specific journals and periodicals which cover these topics are: Military Review, The Journal of Electronic Defense, Defense Management Journal, Signal, and Military Intelligence. There are several U.S. Army field manuals that cover some of the specific components of C3CM, however, there are no Army field manuals that cover C3CM

in its entirety. Published books that cover components of C3CM have been increasing due to the changing technological nature of warfare. The majority of books available, covering C3CM topics, were published within the last twenty years. Books that cover C3CM topics provide insight into the nature of future warfare and its relationship to the components of C3CM.

Since literature on C3CM is available only in pieces, research will focus on the specific components of C3CM. After gathering the information, analysis of it will be conducted by "brain storming" the information into a usable format. The information will then be organized to support a complete C3CM strategy for the tactical corps headquarters.

---

[1]Frank Barnaby, The Automated Battlefield, (New York: The Free Press. 1980). 105-106.

[2]Julian L. Simon, Basic Research Methods in Social Science, (New York: Random House, 1969) 52.

CHAPTER TWO

DESCRIPTIVE ANALYSIS OF COMMAND, CONTROL, AND COMMUNICATIONS COUNTERMEASURES (C3CM)

WHAT IS C3CM?

Command, Control, and Communications Countermeasures (C3CM) as a battlefield activity is misunderstood. C3CM is listed in FM 100-5 as an activity "typically conducted as part of deep operations and must be focused against enemy capabilities that most directly threaten the success of projected friendly operations."[1] C3CM has become much more than a deep operations activity. C3CM is a way of fighting.[2] It is a complex process that requires careful planning and execution to be successful. With the fielding of many new systems throughout the Army, the opportunity for a commander to plan and execute C3CM operations increases. The increase in technology of armies throughout the world requires a close look as to how the U.S. Army plans and conducts C3CM operations.

C3CM as defined by Department of Defense (DOD) Joint Chiefs of Staff (JCS) is: "The integrated use of operations security, military deception, jamming, and physical destruction, supported by intelligence to deny information to the enemy, to influence, degrade, or destroy adversary C3 capabilities and to

protect friendly C3 against such actions."[3] Under the JCS definition, C3CM is comprised of two major components: Counter C3CM which includes those measures taken to deny enemy decision makers the ability to effectively command and control their forces and C3CM Protection which entails those measures taken to maintain the effectiveness of friendly capabilities in the face of actual or potential enemy counter-C3.[4]

The Army's definition of C3CM is similar to the JCS definition and includes both offensive and defensive counter and protection measures. The Army definition states that C3CM is executed by employing four tools: operations security (OPSEC), deception, jamming and destruction. The U.S. Army Field Manual Corps Operations discusses C3CM as a "relatively new term." C3CM cannot be developed as an end to itself, but as a part of every operation. To be successful C3CM is dependent on effective procedures, established and practiced."[5]

By any definition, C3CM has progressed to the point of being a primary planning consideration for Army units at all levels. Even at the lowest level, units must implement the components of C3CM protection, while at the higher level, units consider counter C3CM actions. All C3CM actions, in the future, will require a coordinated, well planned effort.

THE COMPONENTS OF C3CM

Operations Security (OPSEC) provides the C3CM protection measures required for successful operations. The design of OPSEC measures at the tactical level is primarily to deny

targeting information to the enemy. OPSEC conducted by tactical units usually falls into the normal standard operating procedures of passive measures to include camouflage, cover and concealment and dispersion. These simple actions, practiced since the beginning of warfare, still apply in today's highly technological warfare. Even if opposed by a sophisticated enemy equipped with a highly developed target acquisition system, simple OPSEC measures still afford a level of security and can provide crucial time on the battlefield.

Similar to an intelligence analyst who, in the planning phase, conducts intelligence preparation of the battlefield, a good OPSEC staff officer should conduct an OPSEC preparation of the battlefield. The OPSEC officer develops an estimate of the enemy reconnaissance and collection capability. After the enemy estimate is complete, the OPSEC officer takes primarily two actions within the scope of the C3CM strategy. The first action is to create an OPSEC annex for the operation that provides for specific OPSEC protection measures thus insuring that the C3CM protection measures taken are appropriate to the threat. The second action is to develop counter-C3CM offensive measures that prioritizes what enemy reconnaissance and collection systems are the greatest threat and which systems to destroy first.

The analysis the OPSEC officer used in development of counter-C3CM measures provides the framework for the counter-reconnaissance plan. The OPSEC officer can in some regards be considered a G-3 operations counter-reconnaissance

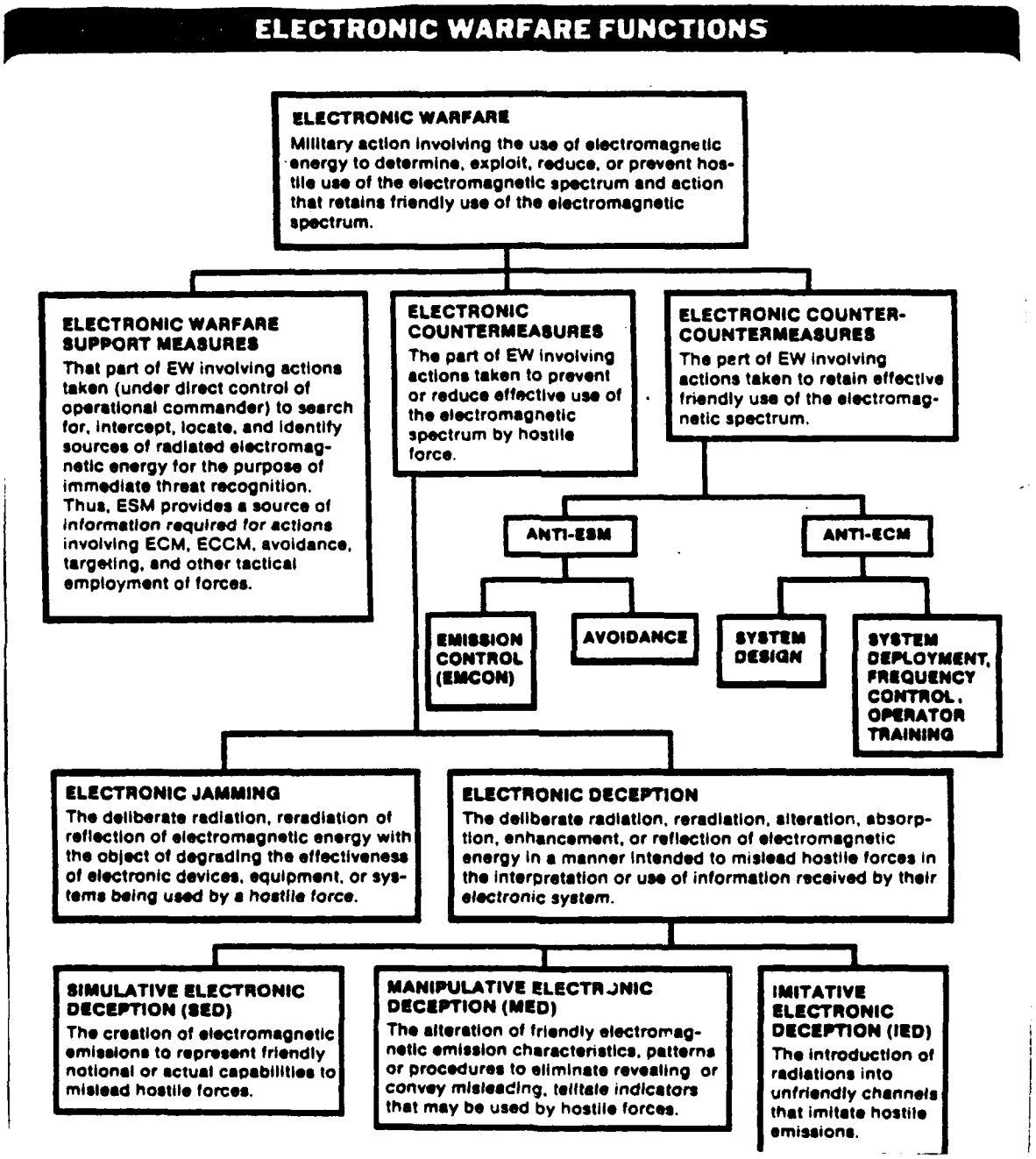
officer. The OPSEC officer should develop a counter-reconnaissance matrix in coordination with other elements of the G-3 section that targets enemy reconnaissance and collection systems that pose the greatest risk to the unit. The OPSEC officer, in coordination with other G-3 elements, can develop a counter-reconnaissance matrix and time line to support the friendly operation. A well planned and executed counter-reconnaissance plan will confound the enemy's decision making process by denying him the crucial intelligence information he needs.

Electronic warfare (EW) has been clearly proven as a combat multiplier in Airland battle doctrine. As a component of C3CM, electronic warfare can focus its three primary elements to support C3CM measures. The elements of electronic warfare are electronic support measures (ESM), electronic countermeasures (ECM) and electronic counter-counter measures (ECCM). The elements of electronic warfare and their definitions are shown in figure 1.

Each element of EW has its own specific relationship to C3CM. In counter C3CM actions electronic support measures (ESM) collect the data necessary to attack enemy systems while electronic countermeasures (ECM) jamming attacks and disrupts the enemy systems. EW supports C3CM protection OPSEC actions with electronic counter-counter measures (ECCM) to protect the friendly force with primarily passive communications measures. EW also supports C3CM deception activity with Manipulative

FIGURE 1

ELECTRONIC WARFARE DEFINITIONS



Source: Department of the Army, FM 34-1, Intelligence and Electronic Warfare Operations, (July 1987), 2-17.

Electronic Deception (MED) and Imitative Electronic Deception (IED). MED involves changing the electromagnetic profile of friendly forces to mislead the enemy. IED injects false and misleading information or radiations directly into the enemy's communications network.[6] The relationship of EW terms to the C3CM framework are displayed in figure 2.

C3CM is tied heavily to electronic warfare (EW). The EW community within the Army has been one of the leaders in the development of the EW component of C3CM. As a result C3CM is sometimes mistakenly thought by planners to be an electronic warfare specific activity. In reality, electronic warfare is only one part of the C3CM process which can work either independently of, or in combination with, the other components of C3CM. Thus, C3CM is not only electronic warfare, but a total package of actions that must be planned, coordinated, focused and executed properly to succeed. The other components of executing C3CM; OPSEC, maneuver, destruction and deception can not be ignored.[7]

Battlefield Deception is an important component of the C3CM strategy and it is employed in concert with the other components of C3CM. Battlefield deception complements the other components of C3CM in the counter C3CM and C3CM protect role. In the counter C3CM role, deception is used to inject false information into the enemy's decision cycle. The false information distorts the enemy's ability to respond to the real situation. In the C3CM protect role, deception can nullify or

Figure 2

RELATIONSHIP OF EW TERMS TO C3CM

C3CM COMPONENT	MISSION	MEANS
DESTRUCTION	DESTROY	FIRES, MANEUVER, CAS, BAI, ECM SUPPORTING DESTRUCTION MEANS
JAMMING	DISRUPTION	EW: ESM ELECTONIC SUPPORT MEASURES ECM: ELECTRONIC COUNTER MEASURES
DECEPTION	DECEIVE	MED: MANIPULATIVE ELECTRONIC DECEPTION IED: IMITATIVE ELECTRONIC DECEPTION
OPSEC	DEFEND	DEFENSIVE EW ELECTRONIC COUNTER-COUNTER MEASURES

SUPPORTED BY
SIGINT: SIGNALS INTELLIGENCE
ININT: IMAGERY INTELLIGENCE
HUMINT: HUMAN INTELLIGENCE

Source: Robert C. Van Kirk II, "EW Training," Military Intelligence Magazine, (Jan-Mar 1982), 50.

degrade the enemy's target acquisition and mask the indicators of true friendly intent.[8]

The lethal or destruction component of C3CM is not as easily defined as the other components of C3CM. The component of destruction is concerned with identifying high pay-off targets, with the most effective intelligence collection means and in a synchronized manner that supports the operation. The objective of destruction is to obtain the optimum mix of resources to bring the best combination of lethal and nonlethal assets to bear on the enemy.[9] The use of maneuver, artillery, and aircraft are considered the principal destructive means to support C3CM activity.

SUPPORT TO C3CM

C3CM activities require the support of two elements to be successful; intelligence and communication. Based on the commander's mission, intelligence provides the foundation of information required on enemy C3 capabilities. Intelligence information from all available sources is collected, analyzed, evaluated, and disseminated on enemy C3. This will provide the starting point of target prioritization to support the operation. Communications provides the link that keeps us ahead of the enemy decision cycle. A good communications system allows for the timely dissemination of information and orders to support C3CM. C3CM will never work without an effective communications system.[10]

EVOLUTION OF C3CM STRATEGY WITHIN THE U.S. ARMY

The concept of command, control, and communications countermeasures (C3CM) has been evolving over a number of years into a strategy that will produce the synchronized effect required for the Army's future Airland Battle concept. C3CM in the U.S. Army has slowly evolved since the end of the Vietnam War. Early in its conception stage in the 1970s, the term of C3CM set a definition to pieces of warfare that had been successful in the past. In the 1980s the Army spent huge sums in the development of systems that could assist C3CM activity, but the development of a total C3CM concept and procedures has not yet occurred.

In the early phase of C3CM concept evolution, the C3CM process was primarily considered an electronic warfare problem. In 1982, Lt. Col. Charles F. Smith wrote: "Confusion exists today as to what C3CM comprises. C3CM is not synonymous with electronic warfare"[11] The functions that C3CM initially were supposed to synchronize, during its initial development, were operations security (OPSEC), deception, jamming, and lethal destruction. The initial concept developed for C3CM, displayed in figure 3, would integrate the functions of C3CM into the overall scheme of maneuver supported by the available intelligence and communications structure.

Since its initial concept development, the functional areas of C3CM have had significant developments within their technological framework. The integration of the functions into

THE COMMAND, CONTROL, AND COMMUNICATIONS

COUNTERMEASURES CONCEPT (C3CM)

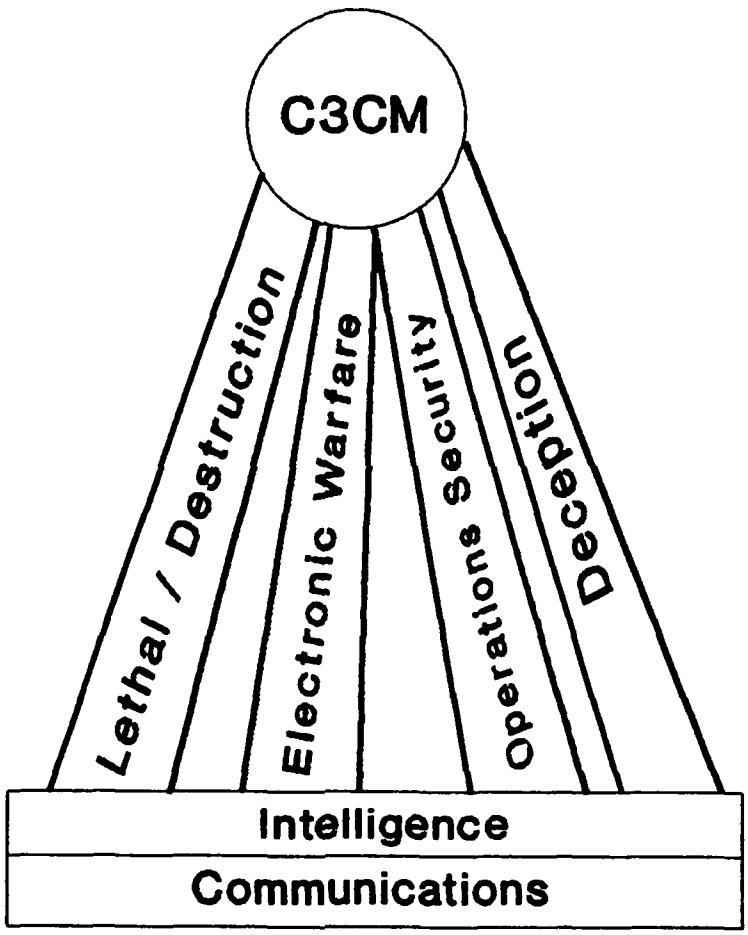


Figure 3

Source: Charles F. Smith, LTC. U.S. Army, "Command, Control and Communications Countermeasures," Military Review, (Jan 1983), 70.

a synchronized operation has become the most critical requirement for effective C3CM. A new concept is needed for C3CM, which employs the components of C3CM in a coordinated and continuous effort. The new C3CM planning process developed has to be able to synchronize within the scope of current combat operations and assist future planning within the Airland Battle framework. A possible future concept development of C3CM strategy, depicted in figure 4, displays the growing nature of the C3CM concept. New components and elements of the foundation have been added.

The lethal/destruction component of C3CM has never been clearly defined. Unlike the other components of C3CM there is no dedicated responsible section to plan and monitor the progress of this component. The destruction component of C3CM would come under the supervision of the G-3; however, since it is tied to targetingdestruction means, the artillery fire support element (FSE) has been the real focal point for destruction planning of enemy C3 systems. This has caused the maneuver aspect of the destruction component of C3CM to be ignored. Maneuver should be added as an additional component to C3CM to fix this problem.

Maneuver in support of C3CM operations has advanced to the point where it should no longer be a portion of the lethal/ destruction component of C3CM. Maneuver now merits a place as a separate component of C3CM due to its increasing importance within the scope of C3CM operations on the future battlefield.

FUTURE DEVELOPMENT OF THE COMMAND, CONTROL, AND COMMUNICATIONS COUNTERMEASURES CONCEPT (C3CM)

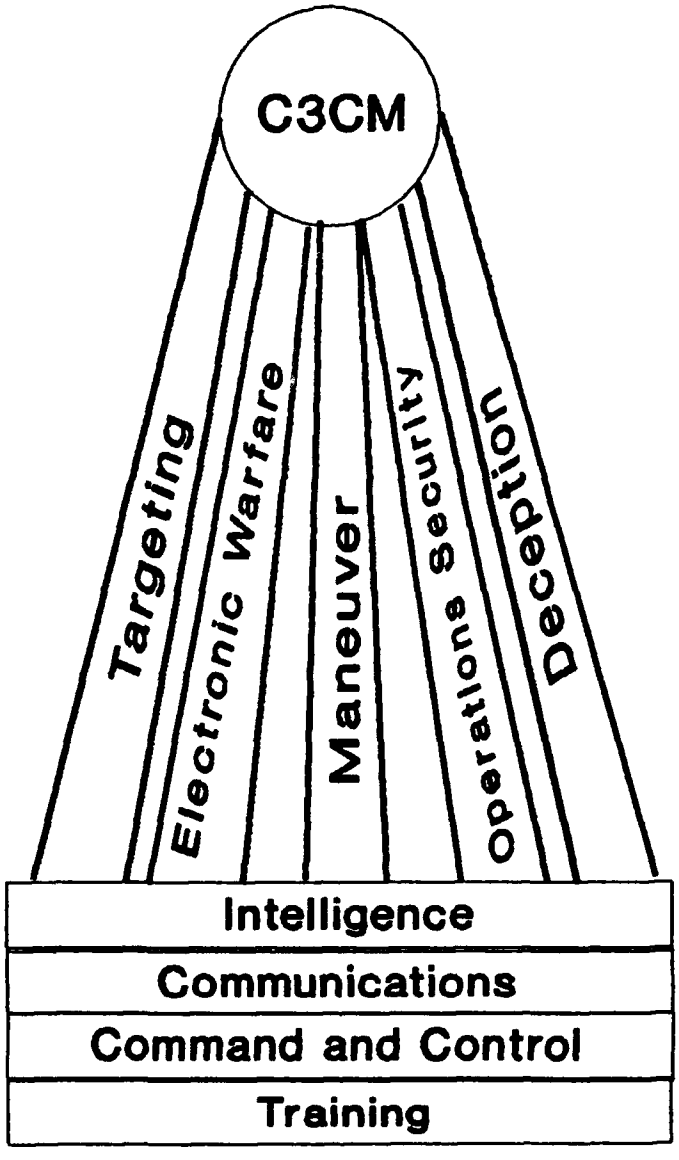


Figure 4

Source: Developed by author.

The destruction component of C3CM should remain to focus the targeting of C3CM under the FSE supervision; however, maneuver should be separated from the destruction component and be under the G-3 supervision. As a separate component of C3CM, maneuver would receive the attention it requires.

The foundation of the C3CM concept in figure 3 has also expanded. C3CM relies on two additional elements of the future battlefield. The original elements of the C3CM foundation, intelligence and communications are still valid. Added to the foundation are the elements of C3CM training and friendly unit command control communications and intelligence system (C3I). The reason these two additional elements are required within the C3CM framework is that C3CM will require a well developed friendly C3I system in which to operate on the future technological battlefield. Included with the requirement for a well developed C3I system is the need for well trained personnel who can plan and execute the C3CM strategy.

The C3CM concept continues to evolve with the upgrade of Army doctrine. The proposed doctrine for the Army called Air Land Battle Future (ALBF) places significant importance on C3CM. Doctrinal writers for the Army are placing C3CM activities high on their list of planning considerations for future warfare. Surviving and winning on the battlefield will require development of new procedures to accommodate proper employment of C3CM.

Some of the primary concepts developed for ALBF include

C3CM activities. According to Major General Stephen Silvasy Jr., Deputy Chief of Staff for Concepts and Doctrine Developments at U.S. Army Training and Doctrine Command (TRADOC), units on the future battlefield, not involved in combat operations, will have to enhance survivability by remaining dispersed and well to the rear of the battle zone and avoid release of electronic and thermal signatures. Units will have to move frequently and effectively. The units will then move along multiple routes to mass quickly against the enemy. This concept of movement for ALBF is using the C3CM components of maneuver, OPSEC and deception to protect friendly units from presenting a mass target and deceiving the enemy's command and control system as to friendly intentions.[12] Under this concept the components of C3CM will have to be coordinated into the overall scheme of a coordinated plan. The plan is developed using automation, assisted by intelligence, communications, and command and control.

The new concept of movement for U.S. units will be a complex operation requiring careful planning and execution to be successful. During the 1991 Gulf war, U.S. and coalition allied units executed this concept by moving great distances along the Iraq, Kuwait and Saudi Arabian borders. The introduction of the new Airland Battle Future Doctrine (ALBF) combined with lessons from Operation Just Cause in Panama and Operation Desert Storm in Kuwait will be instrumental in the further development of the C3CM concept. Maneuver has proven itself as the most effective

possible new component of C3CM action by its most recent use in Panama and Kuwait. To use maneuver as a component of C3CM in the future will require effective procedures and planning in conjunction with the other components of C3CM.

PROBLEMS WITH C3CM AT THE CORPS LEVEL

After defining what C3CM is, it is important to realize what the concept of employment of C3CM is, or the how and when it is conducted within a corps. The U.S. Army Corps Operations field manual provides a brief description of how and when C3CM is used at the tactical level. The procedures and structure necessary to conduct C3CM need further development. The manual provides that the G-3 in the corps plans C3CM and activities that execute the C3CM strategy in conjunction with the OPSEC staff element, the battlefield deception element (BAT-D) from the military intelligence brigade, the EW section from the corps tactical operations support element (CTOCSE), the corps artillery fire support element (FSE), and the Airforce Battlefield Coordination Element (BCE).[13]

How and when the corps G-3 coordinates the components of C3CM with the required staff elements within the corps is not developed. The coordination problem is not a small one. The coordination with the required corps staff elements and units to properly plan and execute C3CM cannot be effectively executed without current procedures and established organizations.

The planning process for C3CM operations, at the corps tactical level, is the critical element that the Army needs to

develop. A thoroughly coordinated plan, implemented at the tactical level of command, against the enemy's entire command control and communications (C3), supporting intelligence and counter-C3 system will produce results several times greater than those of the more traditional ad hoc approach. Other results of coordinated C3CM planning will include better preparation to recognize and react to a C3 target of opportunity or prevent friendly C3 vulnerability.[14]

Although the Army has had great success in the Gulf War against Iraqi forces using elements of C3CM, this has occurred at the operational and theater level command. The Army does not have a doctrine or structure for the planning and execution of C3CM at the tactical corps level. There are many reasons for this lag in C3CM doctrinal development. As mentioned, technological developments in the functional areas of C3CM have taken place within a limited framework of requirements, and not as a part of an integrated C3CM system. Doctrine normally lags behind technology. Not until the new technology proves its worth, does doctrine begin to reflect the new development.[15] Other armies have used C3CM as an integrated way of fighting, but US forces had yet to try C3CM concepts in any large combat tactical action until recently in the both Operation Just Cause in Panama in 1990 and Gulf War of January 1991. These experiences also have been primarily at the theater and operational level and not provided the environment for planning and execution of independent corps level tactical C3CM. Assets

and systems that support C3CM, available at the tactical level, are just now proving their worth, and combined with effective procedures would provide many benefits for the corps commander.

As a result of the technological changes that have taken place in warfare, the Army needs a C3CM structure, at the corps level, that eases the synchronization process outlined in FM 100-5, ". . . the arrangement of battlefield activities in time, space and purpose to produce maximum relative combat power at the decisive point."[16] The development of a C3CM planning structure can make a significant contribution in this area. Current planning for C3CM within units can no longer be made in isolation. Planning for C3CM must take into account, operations and intelligence staffs, fire controllers and jammers, communications staff and other special staff members as required. C3CM depends on effective planning in concert with the commander's overall concept of operations if it is to achieve significant effectiveness.[17] The structure must take into account the commanders intent and combine C3CM elements to produce the desired effect.

Unlike other functional areas of Airland Battle, C3CM does not have a proponent. C3CM has normally been integrated as an intelligence type activity and not as a process large enough to encompass the full range of force elements.[18] C3CM as a battlefield activity is not taught to future staff officers. Planners at the tactical level have difficulty coordinating the

components of C3CM, and many officers do not understand how C3CM works. As a result C3CM has been worked by various groups, within the Department of Defense or the Army, that have adopted C3CM as their own mission in life. Due to the technical and complex nature of C3CM, its real value has been diluted by making it appear too difficult for the average unit. C3CM is then considered a piece of software or C3CM equipment, instead of a battlefield process for planners to use.

C3CM REQUIREMENTS

Requirements for C3CM create a complex situation for planning staffs. Units planners must have well developed procedures for planning the components of C3CM in order to integrate them into a C3CM strategy to support an operation. The supporting aspects of C3CM such as intelligence, communications and automation are another consideration in developing the overall C3CM plan. A support system that plans and implements the concept must be built around the C3CM planning structure. Requirements for C3CM are achievable at the corps tactical level. Systems required to carry out and support C3CM are in the field today. The C3CM concept can be employed at the tactical level and needs only procedures and training for planners to implement.

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CHAPTER 3

C3CM IN RECENT CONFLICTS

Command, Control and Communications Countermeasures have been traditionally viewed as technology intensive activities that are too complex to coordinate. However, the technological elements of C3CM were recognized as early as Oct. 14, 1969. General W. C. Westmoreland, Chief of Staff, U.S. Army in an address to the Association of the US Army stated, "I see an Army built around an integrated area control system that exploits the advanced technology of communications, sensors, fire direction and automatic data processing, a system that materially assists the tactical commander in making sound and timely decisions."[1] Since then, the technology that General Westmoreland spoke of, has developed and proven itself in war.

Two recent conflicts worth noting where technology and C3CM techniques were used, outside of U.S. Army experience, were the Falkland Islands Campaign and the 1982 Lebanese War. These two conflicts are significant in that new elements of technology and operational concepts related to C3CM were employed for the first time in combat. Although the techniques and the technology used during these conflicts do not provide complete

answers to future C3CM techniques, they offer the most developed examples of the application of C3CM and some insight to the changes of future warfare.

The Falklands Conflict

The Falkland Islands Campaign is important in the consideration of future C3CM systems. British forces were able to integrate technology into their decision making process enabling them to keep ahead of the enemy decision curve. Computer technology, with proper organization and training, gave the British forces a significant edge during the Falklands conflict.[2] This gave the British the capability to rapidly assess the tactical situation and make decisions in targeting before the enemy could react. The Falklands conflict offers several examples of how technology, training and organization combine to produce the effects of C3CM.

Command and Control

British command and control were centralized for both the land and sea forces under Rear Admiral Sir John Woodward until the headquarters of the commando brigade was established at San Carlos Bay. British command, control and communications (C3), had significant advantages during the Falklands Campaign. The British forces had access to U.S. military communications satellites and were better supplied with secure communications equipment than the Argentine forces. The British were able to operate in an atmosphere in which they did not have to contend with equally sophisticated electronic warfare (EW) assets in the

hands of the enemy. Even with these significant advantages, British command and communications on land often broke down in rough terrain or at moderate distances.[3] These problems were overcome through training and initiative until communications could be reestablished.

The more modern computerized command and control (C2) systems of the British, gave them the ability to furnish, in real time, to decision makers, the intelligence needed to produce an overall situation. Conducting rapid and accurate situation analysis enabled British commanders, in some cases, the ability to make a rapid evaluation and take appropriate action before the enemy could react. This capability, which is a requirement for C3CM, was a significant factor contributing to British success.

Despite the use of superior technology, the British suffered from inadequate fusion of multiple sources of intelligence and the rapid communication of the information. The time it took to collect, analyze and transmit the information from strategic intelligence agencies to the field commander was in some cases too long. One example of this inadequacy was that the British had obtained signals intelligence (SIGINT) data in London that gave the entire Argentine order of battle at Goose Green. This information would have prepared the British commanders better in that there were nearly 1,050 troops in the area rather than the 100 they expected. The Royal Navy also failed to provide rapid

communications of information to British land commanders.[4] This was caused primarily by an inadequate communications interface from ship to shore, highlighting the need for total fusion of command and intelligence data at every level of operational command in wartime.

To conduct fusion of command and intelligence data in the future, the British Army developed a battlefield management computer system called the Wavell 2. The Wavell 2 is designed to be compatible with the British Ptarmigan and other NATO area communications systems.[5] The overall system makes use of microcircuitry and digital communications to provide rapid, secure, and flexible control on the battlefield.

In contrast to the British, Argentine command and control suffered from interservice rivalry and an unwillingness of officers to exercise leadership in any meaningful way. The Argentine forces had limited secure communications capability and often transmitted in the clear with no proper communications discipline, giving the British forces additional advantages. The Argentine forces never maintained any kind of centralized control over major combat formations and assets.[6] The lack of a coordinated effort was a significant factor in the Argentine failure to successfully counter British forces.

Argentine command and control links were tied to a highly political-military system. They maintained four separate command and control links, each independent of the other and never coordinated together. The four C2 links the Argentine

forces used were the Army command link located within the Falklands, the naval system, the airforce system and the political-military system located in Argentina. None of the four C2 links used by the Argentine forces had the proper sophistication and technology to coordinate the operations. As a result, the British at times had difficulty forming a coherent picture from intelligence gathered because it often included conflicting orders and directives issued by each system.[7]

Targeting

Ammunition resupply of cannon artillery was one of the critical problems faced by British forces. In the targeting process of Argentinian forces, the British had to ensure artillery cannon fire was not wasted. As a result, all firing missions required precise targeting and prioritization. All artillery missions fired by British forces had to consider conservation of ammunition. One of the primary targets was Argentinian command and control. Artillery fire was directed by interacting electronic systems with ground artillery units. The combination of careful targeting against Argentinian C3 proved extremely accurate. As a result of these systems and procedures, Argentinian command and control positions suffered heavy punishment and their radar and communications systems were frequently put out of action.[8]

The Argentine forces made poor use of their artillery resources despite the significant number of artillery tubes available to them. Argentine forces had four 155-mm howitzers,

thirty 105-mm howitzers and numerous 81-mm mortars.[9] The Argentine forces had more firepower available on the ground than the British; however, they never aggressively sought out and called in specific targets. No disciplined targeting system had been established within the Argentine Army.

Electronic Warfare

In the electronic warfare (EW) area of C3CM, the British used some limited interception of communications combined with reconnaissance to locate Argentinian command and control elements. This was key in the British analysis of enemy intentions and countermeasures taken against Argentinian forces. The early determination of enemy positions and intentions assisted in the development of the British maneuver plan.[10] The British did have to rely heavily on satellite electronic collection systems from the U.S. for theater information, but this was not responsive to the theater commander's needs. The British commander relied primarily on EW collection systems in theater to provide more timely information. The British problem in the area of electronic warfare dealt with the availability of modern tactical threat assessment technology in a rapidly deployable form with near-real time readout and analysis capability.[11] Even with this deficiency, the British forces used available information in a far more efficient manner than Argentinian forces.

Argentina had some capability in the electronic warfare area, to include airborne electronic support (ESM) and signals

intelligence (SIGINT) capability. Argentine forces also had radio direction finding equipment which was sufficiently advanced to present a real threat to British forces. However, the threat from Argentine electronic warfare elements never materialized. Lack of procedures and training for integration of the intelligence and targeting within Argentine forces for these systems caused them to receive no significant benefit.[12]

Training

One of the key lessons the British learned from the war was the importance of military professionalism and innovation of the soldier. British superior training, readiness, and leadership decided the outcome.[13] Regardless of force numbers and weapons, professionalism and innovation became a force multiplier. The lesson clearly shows that technology must be combined with proper procedures and training to be effective.

C3CM and the Falklands War Overview

The Falklands Conflict is useful in the study of C3CM because it is one of the first times that technology and C3CM activities were combined in a coordinated effort in modern combat. The technology and procedures the British forces employed were not perfect, and to some degree, planned and conducted in an ad hoc manner. Even with the command and control problems the British faced, the initiative displayed by British forces produced significant results that provide important lessons in employment of C3CM and the study of future warfare. The use of technology and C3CM procedures in the

analysis of the Falklands Conflict cannot be credited with the final victory for British forces, but as factors that enhanced the ability to conduct warfare on a more decisive scale.

The 1982 Lebanese War

The 1982 Lebanese War between Syria and Israel offers significant insight concerning future technological war and the use of C3CM. Unlike the Falklands Conflict where British forces used ad hoc command and control (C2) organizations to coordinate their efforts, the Israeli forces had developed a command and control system that was in place and prepared to conduct coordinated operations.

C3CM Command and Control Requirements

The Israelis exploited command, control, communications and intelligence (C3I) systems with excellent results in the Bekaa Valley in 1982. Like the British forces in the Falklands, coordinated use of C3I systems enabled the Israelis to acquire relevant information and pass it on quickly to those in command. The war in Lebanon for the first time saw the development and use in combat of a corps level headquarters as the controlling headquarters for tactical operations planning. With this came the implementation of C3I links from the forward line of troops (FLOT) to the corps. For the first time, real-time intelligence was introduced on a continual basis within a corps level headquarters. Operations personnel in the corps were required to react to real-time intelligence in controlling the battle.[14]

Electronic Warfare

In conjunction with maximizing the use of their own C3I systems, the Israeli forces used electronic countermeasures (ECM) against enemy C3I systems to deny the enemy the ability to make timely decisions. There was widespread coordinated application of ECM in conjunction with targeting against enemy C2. Just before or just at the outset of a battle, weapons systems and ECM were used against enemy radars, communications networks, and C2 centers. The enemy was paralyzed, unable to see, hear or communicate in any way. This was a clear demonstration of how to conduct electronic warfare (EW) taking maximum advantage of the concept of C3 countermeasures and exploiting technology.

Reconnaissance

By combining reconnaissance technology, specifically unmanned or remotely piloted aircraft (RPV), with material destruction by the means of maneuver, artillery and aircraft, the Israeli forces created a synchronized targeting system to destroy the enemy. Mini-RPVs provided observation capabilities that allowed intelligence officers operating safely behind front lines to visually survey any portion of the battlefield on a real time basis and provide forward observation for artillery. As a result of this campaign, Israel has developed three generations of RPVs and, recently, fielded a fourth generation model. The typical cost of these systems are minimal at $20,000 to $50,000.[15] As was the case with the British in the

Falklands conflict, the synchronization of technology and C3CM was key in the Israeli analysis of enemy intentions and countermeasures against Syrian forces.

Operations Security (OPSEC)

Operations Security (OPSEC) procedures conducted by the Israeli forces during the conflict were a significant part of the C3CM effort. The Israeli forces made use of (COMSEC) equipment during the 1982 war which was an improvement over previous wars. The use of COMSEC equipment was credited with providing protection from enemy interception and artillery fires. In contrast, the Palestine Liberation Organization forces (PLO) made use of commercial phones with no encryption and little security techniques. As a result, the Israeli forces could react well in advance to enemy plans. The Syrian forces, when in defense positions, used primarily military wire lines, and practiced secure and disciplined communications making interception difficult. When Syrian forces began offensive movement, they lost signal discipline and were forced to use unsecure radio systems which were detected early by Israeli forces.[16]

Lessons Learned Related to C3CM

The application of modern technology during the 1982 War did provide some lessons for the Israeli forces. Some of the problems that occurred with technology in the area of C3I were (a) radio nets failed in built up and mountainous areas, (b) the amount of message traffic sometimes overwhelmed communications

systems, (c) over-compartmentation, separated command, communications, and intelligence activities created coordination problems and duplication of effort and, (d) a lack of digital or automatic routing for message traffic caused delay in transmission of vital information. Commanders expressed the opinion that the technology was grossly over exaggerated, and poorly exercised.

Another lesson was that command, control, communications and intelligence (C3I) computer systems had been used in a simulated manner during pre-war exercises and, therefore, were misunderstood. A training gap existed with C3I systems and the personnel who had to operate and manage them. The only way this could be fixed was through experiences gained during the war.

The offensive tended to overburden C3I capabilities. The Israeli C3I net had a tendency to be too slow with poor reaction time when conducting offensive operations and proved to work better in defensive operations. Some commanders believed the operational capability of C3I technology to be overrated and not responsive enough to their needs and that offensive operations put too much pressure on the C3I net.

The C3I system was not fully proven in simulation and exercises before the 1982 War and not fully ready for operational use.[17] While their C3I system had its problems, the primary lesson was still obvious; coherence, and speed of reaction in C3I and combined operations are the dominant factors in shaping military effectiveness and are often far more

important than numbers. The key operational lessons learned by Israel from the 1982 fighting was that it could benefit more from improving the quality of its existing force structure and its ability to use weapons more effectively than by increasing numbers of weapons.

TRAINING FOR C3CM IN THE FUTURE

A consistent lesson from the 1982 War was in the area of force quality. The requirement for highly trained soldiers in future conflicts was clearly demonstrated. The Arab-Israeli experience indicated that a combination of superior training, maneuver capability, tactical and technical innovation can offset sheer mass.[18] During the conflict the level of training and application of new systems in combat proved to be very important. In terms of using available technology to its full potential the Israeli forces were far ahead of their Arab adversaries. In many cases the availability of technology was not a deciding factor for the Syrian forces. Syrian forces suffered from a lack of training and practice with technological systems. It became clear that the total synergism of the soldier and technology determined combat effectiveness. The Syrians had sophisticated air-defense systems, electronic warfare systems, modern T-72 tanks, new aircraft and attack helicopters, but then had never combined their use in a systematic approach. The soldiers had been trained on the mechanical use of the systems, but not the operational and tactical uses. The man-machine interface was not complete. The

former commander of the Israeli Air Force, General Ezer Weizmann stated, "The human factor will decide the fate of war, of all wars; not the Mirage nor any other plane, and not the screwdriver, wrench, radar, missiles or all the newest technology and electronic innovations."[19]

The enhancement of combat operations through the use of technology and C3CM procedures can be quantified. In all conflicts between Arab and Israeli forces, losses had been in favor of the Israelis, but never to such a degree as in their battles against the Syrians in Lebanon. A ratio of aircraft losses of over 50:1, the suppression of Syrian SAM systems and the destruction of large numbers of tanks can in large part be attributed to a higher degree of technology and use of C3CM procedures by the Israeli forces. Current combat effectiveness value (CEV) analysis of Israeli forces with respect to the Syrians after the conflict, rates 100 Israeli in a combat unit as the equivalent of about 210 Syrians. This does not mean that each Israeli soldier was smarter, stronger, or braver than the Syrian troops. It means that when organized, trained, and committed to battle in combat units, Israeli forces were used more effectively than the Syrians.[20] The implications for C3CM indicate that training is critical for future operations in war.

The Future of C3CM in Israel

As a result of the 1982 Lebanon War, Israel is steadily improving its capability to conduct C3CM operations. The major program that Israeli forces are developing is keyed on

reconnaissance, targeting, C3I/battle management (BM) and damage assessment technology to allow tighter coordination between air and ground forces. The concept is based on operating in near real time so that the ground combat commander is given continuous information from the rear and can draw on immediate air and artillery support without delay. The key objective of the Israeli battle management program is to preserve freedom of action and maneuver while maintaining a clear understanding of what is occurring at each echelon. Another objective is to preserve the fluidity of the battlefield and the ability to rapidly mix, and combine tactical elements to meet a tactical situation without regard to unit integrity. This concept will provide alternative approaches to maintaining offensive momentum, rapidly commit reserve forces, helicopter, or other combat units to bypass enemy positions.[21]

Implications for the future of C3CM and the US Army

In order to survive, modern armies will have to develop their tactics in step with the latest technology. The Falklands and Lebanon conflicts represent important turning points in the history of war by demonstrating that technology is making a significant impact on offensive and defensive operations. Understanding how the lessons of tactics, technology and the elements of C3CM from these recent conflicts have application today is important to the nature of future warfare.

Automation and C3CM

The ability to use technology properly is a fundamental

requirement for conducting C3CM operations. The British and Israeli forces have learned from their own experience of the need for automated battle management systems to assist both operational and tactical commanders with accurate real time information. This is an area the U.S. Army has devoted substantial resources to develop. Specifically, the U.S. Army has developed the SIGMA Star concept or the five-node command, control and subordinate system architecture.

Communications

Communications of command and control information, intelligence data and other requirements using compatible, reliable and secure equipment was a lesson from the Falklands. The U.S. Army is fielding the Mobile Subscriber Equipment (MSE) and a new family of tactical radios to address past communications shortfalls. The modernization of U.S. Army communications systems by itself however, may not take care of the entire problem. Compatibility issues between the services, NATO, and other allies for the new communications systems are not yet fully resolved. This is an area that will require continued attention in the future.

Targeting

To support an active C3CM plan, a well developed targeting system is required. The importance of target acquisition and target development was a lesson from both the Falklands Conflict and the 1982 Lebanon War. Both the U.S. Army Artillery Center and U.S. Army Intelligence Center have

developed targeting processes in conjunction with intelligence preparation of the battlefield (IPB) that address the targeting requirements.

OPSEC

The need to incorporate OPSEC into C3CM operations was clearly evident during the Falklands Conflict and the 1982 Lebanon War. The U.S. Army is attempting to meet battlefield OPSEC requirements in the technological area with a new family of secure communications equipment, passive camouflage and other training. Even with these measures, OPSEC in the U.S. Army may need more attention. By its very nature, OPSEC is an area that needs constant evaluation against the potential threat. Both British and Israeli forces made up for potential OPSEC problems through superior training and innovation. This is one method the U.S. Army has used and will continue to use.

Electronic Warfare

Interception of communications combined with other means of intelligence to locate enemy command and control elements were key in the British and Israeli analysis of enemy intentions and development of countermeasures. The early determination of enemy positions and intentions through electronic warfare is a high priority for the U.S. Army. The U.S. Army also places emphasis on active electronic jamming of command and control nodes. The U.S. Army has a well developed electronic warfare system to conduct C3CM operations. When combined with other C3CM measures, this system should be able to meet future

requirements.

Training

The training proficiency of the individual soldier, noncommissioned officer, and officer were critical factors in both the Falklands Conflict and the 1982 Lebanon War. The training of U.S. Army personnel receives priority of resources. U.S. Army planners place priority on force training and readiness. This will enable U.S. Army personnel to conduct complex C3CM operations in the future.

Reconnaissance

The Israeli forces learned from the 1982 Lebanon War that combining reconnaissance technology with the destruction of maneuver, artillery and aircraft can produce significant results. Remote Piloted Vehicles (RPVs) are under development within the U.S. Army to provide observation capabilities that will allow for the receipt of intelligence safely behind front lines. The U.S. Army has also developed other extensive reconnaissance assets to assist in target development. One program, the OH-58D helicopter, combines current surveillance technology and artillery targeting. These reconnaissance efforts provide a solid foundation for the support of C3CM operations

Coupled with the new developments in the reconnaissance field, the U.S. Army has developed a new counter-reconnaissance concept. This new concept, developed at the Army's National Training Center, fits in well with C3CM activities. By

targeting and destroying enemy reconnaissance capabilities and degrading the enemy decision making process in a serious manner, new windows of opportunity will be opened for U.S. Army commanders to exploit. A well planned counter-reconnaissance concept has now become a mandatory factor in operational and tactical planning throughout the Army.

RECENT U.S. ARMY EXPERIENCE USING C3CM

Recent events indicate that the Army is putting into practice many of the lessons learned concerning C3CM from previous conflicts. Two recent operations conducted Operation Just Cause in December 1989 and Desert Storm in February 1991, provide insight to the development of C3CM within the U.S. Army. In both these operations C3CM was used at the operational level of war. Direction and planning for C3CM activity came primarily from the joint or theater level of command. Tactical level units primarily executed the higher level C3CM plan.

During Operation Just Cause in Panama, joint C3CM activities between the different services were carefully coordinated. The primary example of a C3CM target, during this operation, was the attack and destruction of the Panamanian Defense Forces Headquarters (the Comandancia). This facility was the command and control headquarters for the Panamanian Army. Its elimination crippled the ability of the Panamanian Army to react in any coordinated effort to the actions of U.S. forces.[22]

The command, control, and communications problem the

Panamanian forces had was similar to the Argentinian experience. The Panamanian Defense Forces (PDF) had a highly centralized command and control system, with no significant backup systems. Panamanian C3 was in the hands of a few select leaders, which if cut off from the PDF, would cause chaos. Panamanian control was highly centralized and invited attack. The combined U.S. air and ground attack on this system was devastating. It took over 24 hours for the Panamanian leadership to take any actions, and the actions they took were uncoordinated and tactically insignificant.[23] This experience demonstrated the need for decentralized and redundant military C3 systems. The highly centralized military command and control procedures of many nations will provide a lucrative target in future conflict.

U.S. intelligence collection efforts against Panamanian forces were significant. The human intelligence (HUMINT), signals intelligence (SIGINT), and imagery intelligence (IMINT) collection both before and during the operation created an almost near perfect picture for the theater commander. For the planner at the joint theater level, intelligence support for planning C3CM type activities was accurate and timely. Similar to the British in the Falklands and the Israeli forces in Lebanon, American forces still had problems with movement of information to the tactical commanders in a timely manner. This was caused, to some degree, by the ad hoc intelligence structure formed before the operation began. The ad hoc intelligence

structure caused some coordination, reporting and communications problems. Similar to the British in the Falklands, U.S. forces fixed these problems, as the operation went on, using initiative and by training the forces in theater.

During the recent Iraqi War, one of the key components of the U.S. Central Command (CENTCOM) strategy was the destruction of the command, control, and communications structure in Iraq. The Iraqi armed forces, like Soviet forces, had a highly centralized command and control system. Iraqi C3 was controlled in an even more centralized manner than that found in Panama. Iraqi command and control, highly centralized, as in the case of Panama, invited attack. The difference between Iraq and Panama however, was that Iraqi forces had significant backup systems. The coalition air attack on this system required a much more significant effort. After over 30 days of intense bombing, with command and control facilities as a primary target, the result was devastation of the Iraqi C3 system.

Not until the ground offensive actually began, however, were the effects of the bombing on the Iraqi C3 system fully realized. The Iraqi frontline forces along the border and within Kuwait were cut off from communications and logistics with their higher command. Iraqi operational reserve forces, the Republican Guard divisions, were unable to react to the movement of coalition forces. Coalition forces, without detection, had moved more than 100,000 troops and over 500 tanks around the Iraqi flank, a distance of over 100 miles. When

Iraqi forces realized their situation and decided to move, their counterattack was uncoordinated as well as too late to be effective. The Iraqi forces were then cut off from escape. When battle was joined between Republican Guard and U.S. forces from the 1st and 3rd Armored divisions, roughly 300 T-72 tanks of the Republican Guard and 800 M1 American tanks fought a classic tank battle. The combination of U.S. tanks, A-10 attack aircraft and AH-64 attack helicopters devastated the Iraqi Republican Guard forces. After the Iraqis had lost over 200 T-72 tanks, according to an interview with a senior Pentagon official, "that's when the Iraqis figured out where the real threat was. They had no idea that there was a huge sledgehammer swinging around to hit them."[24]

The classic flanking maneuver, however, was not the sum and substance of the entire battle plan. In contrast to Operation Just Cause, the intelligence structure to support the operation was much more developed. The intelligence link between the strategic, theater and tactical commanders was not ad hoc, but a well planned and executed structure that worked. The primary reason for the intelligence system improvement, was that the forces went into the operation with the same intelligence structure used in peacetime. There was no need, as was the case in Panama, to develop an ad hoc system, since the intelligence system already in place was responsive.

Deception, in its C3CM role, was used in an extensive manner. Decoys and large scale operational feint movements were

used to affect the enemy decision making process. The image portrayed by the deception operation gave the Iraqi commanders the impression that coalition forces were coming from all directions. This had an effect of isolating enemy units. The counter-reconnaissance efforts of coalition forces, coupled with the destruction of the enemy communications, served to increase the isolation of Iraqi forces. U.S. and coalition forces used an extensive amount of smoke operations to support the deception plan and mask both real and deceptive movements. Vehicles towing chains were used to whip up dust to simulate the movement of large convoys. The dust clouds could be seen by the Iraqi forces 20 miles away. False radio traffic was broadcast for the benefit of the extensive Iraqi network of radio-listening equipment.[25] All of these deception measures aimed at the Iraqi command and control system, overloaded an already badly damaged system. Iraqi C3 was never able to recover from the synchronized C3CM attack conducted on it.

The Iraq war displays the benefits of how C3CM can contribute to a well planned and executed operation. The war provides significant insight on how to plan and synchronize the components of C3CM. Although C3CM was planned primarily, as an operational level strategy in the case of the Iraqi war, the procedures are applicable at the tactical level also. The Iraq war was centered around new technology and procedures that will guide U.S. Army C3CM strategy in the future. The lessons learned from the Iraq war will continue to affect the

development of C3CM strategy at all levels in the Army.

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[12]W. Seth Carus, "Military Lessons of the 1982 Israel-Syria Conflict" in The Lessons of Recent Wars in the Third World, ed. Robert E. Harkavy and Stephanie G. Neuman, (Lexington, Massachusetts: Lexington Books, 1986), 275.

[13]Anthony H. Cordesman and Abraham R. Wagner, The Lessons of Modern War, Volume 1: The Arab Israeli Conflicts, 1973-1989, (Boulder Co; Westview Press, 1990), 158, 162.

[14]Gabriel, 195.

[15]Carus, 275.

[16]Cordesman and Wagner, Volume 1, 162.

[17]Ibid, 163.

[18]Trevor N. Dupuy and Paul Martell, Flawed Victory, (Fairfax, Virginia: Hero Books, 1986), 220.

[19]Ibid.

[20]Ibid.

[21]Cordesman and Wagner, Volume 1, 236.

[22]U.S. Army Training Video, Operation Just Cause, Invasion of Panama, produced by the U.S. Army Audio-Visual Training and Graphics Section, Ft Leavenworth Kansas, 15 min., 1990, videocassette.

[23]Ibid.

[24]Ken Jarecke, "The 100 Hour War," U.S. News and World Report, 11 March 1991, 15-16.

[25]Win McNamee, "The Run and Shoot Offense," U.S. News and World Report, 25 February 1991, 42-43.

CHAPTER 4

CORPS C3CM PLANNING PROCESS

This chapter will analyze the current corps command and control planning process and how it relates to the C3CM concept. The analysis conducted will describe the relationship of C3CM in the decision making process. The analysis will provide for development of a C3CM planning process that can work within the corps planning and decision making process. The C3CM planning process will synchronize C3CM into the overall tactical objective of the corps and become the integrated corps C3CM strategy for an operation.

The current corps command and control process figure 5, consists of three elements; planning, directing and controlling operations.[1] The problem for a planner is trying to integrate the components of C3CM into the planning portion of the command and control process in a synchronized manner. One method in which to integrate C3CM into the corps planning process is to tailor C3CM actions into the mission analysis and course of action development conducted by the corps staff during decision planning; figure 6 displays the decision planning cycle. The relationship between C3CM and the military decision

FIGURE 5

CORPS COMMAND AND CONTROL PLANNNING PROCESS

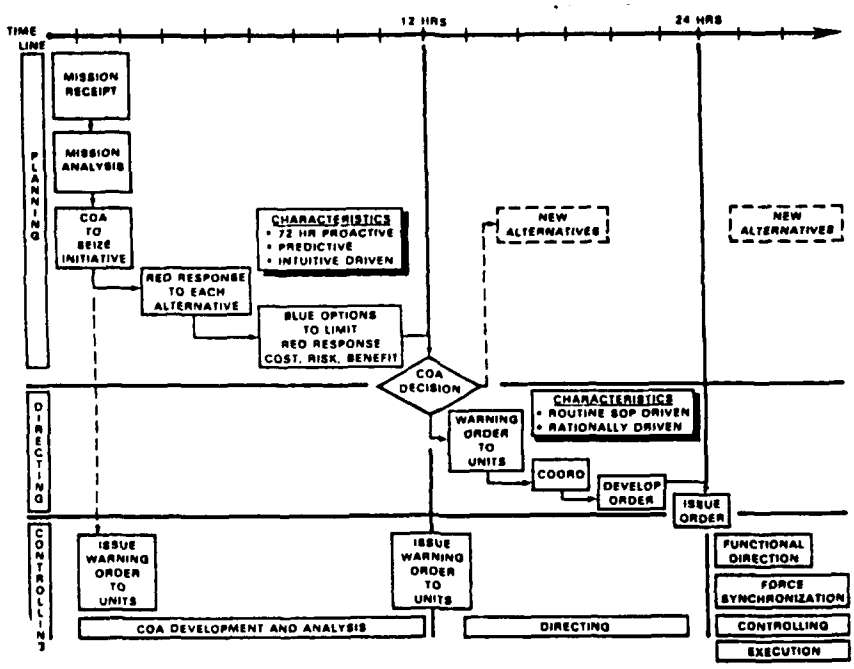
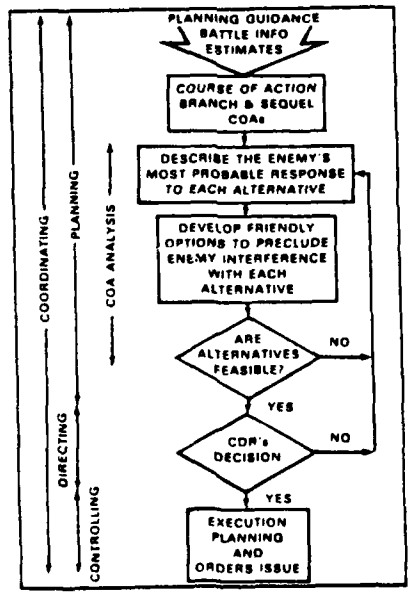


FIGURE 6

DECISION PLANNING PROCESS



Source for figures 5 and 6: Department of the Army, FM 100-15, Corp Operations, (Sept. 1987), 4-22,23.

making process that takes place in the corps planning cell begins by considering what C3CM actions need to take place in a synchronized operation and when the C3CM actions should occur.

C3CM AND MISSION ANALYSIS

Within a corps headquarters, the planning phase begins 72-96 hours before execution of an operation. The corps headquarters derives its mission from its interpretation of the broad guidance provided within the scope of a theater campaign plan. Within the guidance of the theater commander, the elements of the theater C3CM strategy provide the framework for the corps C3CM strategy. During the mission analysis, the commander and his staff identify the objectives that generated the mission. A determination of the enemy's center of gravity is made, to include the things about the enemy that, if successfully attacked, cause the enemy to be unwilling or unable to continue to fight.[2]

C3CM planning can have its initial concept formulated for a tactical operation during the mission analysis stage. In many situations in recent warfare, an enemy's center of gravity can revolve around the enemy's command and control (C2). In a situation where attack of the enemy's command and control structure is a priority objective for success, the planning for C3CM starts immediately at the mission analysis stage. This becomes more important if the corps plan keys on a center of gravity that relates to an enemy's command, control and communications system. During the mission analysis phase, corps

planners may determine that C3CM activities should commence immediately. The best example of a C3CM activity that would commence immediately would be C3CM protection measures (OPSEC) or deception measures. In a situation that presents a significant security problem for friendly operations, C3CM protection activities should commence immediately, specific OPSEC orders and instructions to subordinate commands may be necessary before course of action planning begins. The initial specific C3CM tasks and orders could be issued during the warning order phase as part of the initial warning order.

While the G-3 issues the warning order after the mission analysis stage, the intelligence staff should simultaneously transmit initial priority intelligence requirements (PIR) to collection agencies. The PIR, which provides intelligence information to support friendly C3CM activities, should begin well in advance of the upcoming operation. After a determination has been made of the critical enemy elements (ie., centers of gravity) that should be attacked during the mission analysis, the intelligence planner determines initial PIR. The intelligence staff uses the initial PIR to identify and locate the critical enemy elements. Further development of the PIR would take place during course of action development and analysis. The commander would review and approve the PIR during the course of action decision. Early PIR recognition and tasking for collection would greatly assist in the C3CM effort to support the operation. Traditionally, PIR development takes

place later on in the planning process. With the critically shortened time factor in future warfare, collection against the crucial elements of the enemy should begin during the planning process of an operation.

C3CM AND COURSE OF ACTION DEVELOPMENT

As the corps staff moves into the course of action development phase, primary consideration is given to the defeat of the enemy's center of gravity and protection of the friendly forces center of gravity. Integration of the C3CM protection and attack measures should be an integral part of the development and analysis of each course of action. How the staff plans to use the battlefield operating systems (BOS) during course of action development is closely related to C3CM. The battlefield operating systems of fire support, intelligence and electronic warfare (IEW), maneuver and C2 are components of the C3CM concept minus deception. (See figure 7 for a comparison of the battlefield operating systems and the components of C3CM.)

The use of a synchronization matrix during course of action development for tactical and operational planning, will assist in the integration of C3CM actions in conjunction with the seven battle operating systems (BOS). The concept of C3CM used in an operation should develop simultaneously with the planning of the battlefield operating systems, in order to synchronize the actions taken against the enemy. A synchronization matrix that the U.S. Army Command and General

Figure 7

RELATIONSHIP OF BATTLEFIELD OPERATING SYSTEMS TO C3CM

BOS	C3CM
MANEUVER	MANEUVER TO DESTROY ENEMY C3
FIRE SUPPORT	TARGETING AGAINST ENEMY C3
IEW	EW TO DEGRADE ENEMY C3, COUNTER ENEMY EW
AIR DEFENSE	
MOBILITY/ COUNTERMOBILITY	
SUSTAINMENT	
COMMAND & CONTROL	PLAN/COORDINATE C3CM STRATEGY

Source: Developed by Author

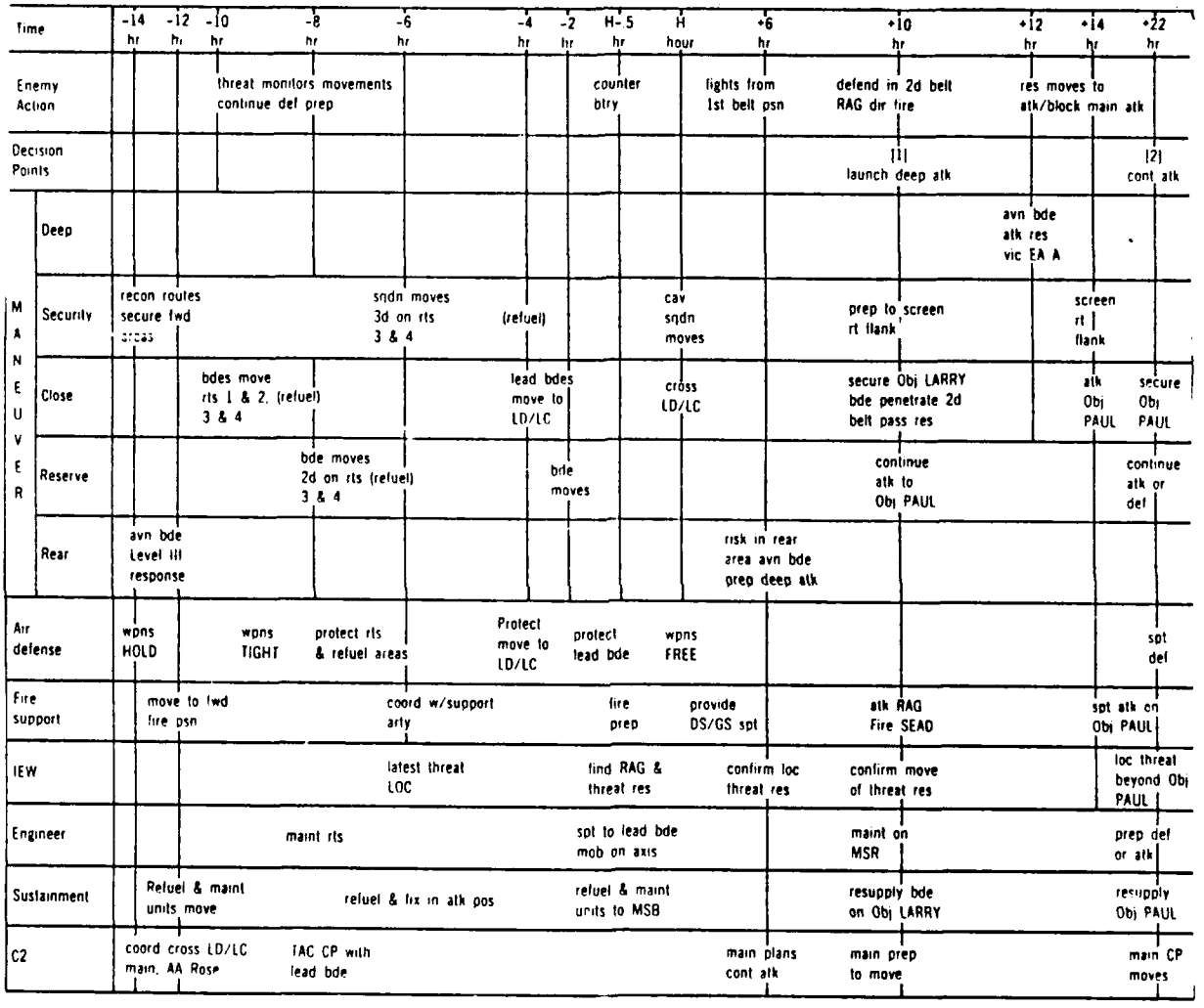
Staff College uses for course of action development and evaluation allows the staff to develop and analyze a course of action over time and space in relation to the enemy's most likely course of action.[3] Many planning staffs in the U.S. Army use this method for planning an operation, or they use a synchronization matrix similar to the example in figure 8.

The timing of C3CM actions is another critical factor in planning. As the timeline for a course of action develops, it is necessary to give careful consideration to C3CM in relationship to the battlefield operating systems. By creating a timeline for friendly and enemy actions, a staff planner develops a list of critical events in time sequence that must be accomplished to attack the enemy's center of gravity. At this point, the timing of C3CM actions synchronize to enhance completion of tasks that must occur during the critical events. Critical events are normally timelined by planners as they develop the synchronization matrix. Adding C3CM activities on the timeline will assist in integrating C3CM into the overall operation. An example of a synchronization timeline combined with C3CM actions is shown in figure 9.

To properly synchronize C3CM actions, planners could add C3CM as an element of planning on their synchronization chart. Another method C3CM planners could use, would be to create a separate C3CM matrix. The C3CM planning matrix in figure 10, is an example of a separate C3CM synchronization matrix that could compliment the battlefield operating system (BOS)

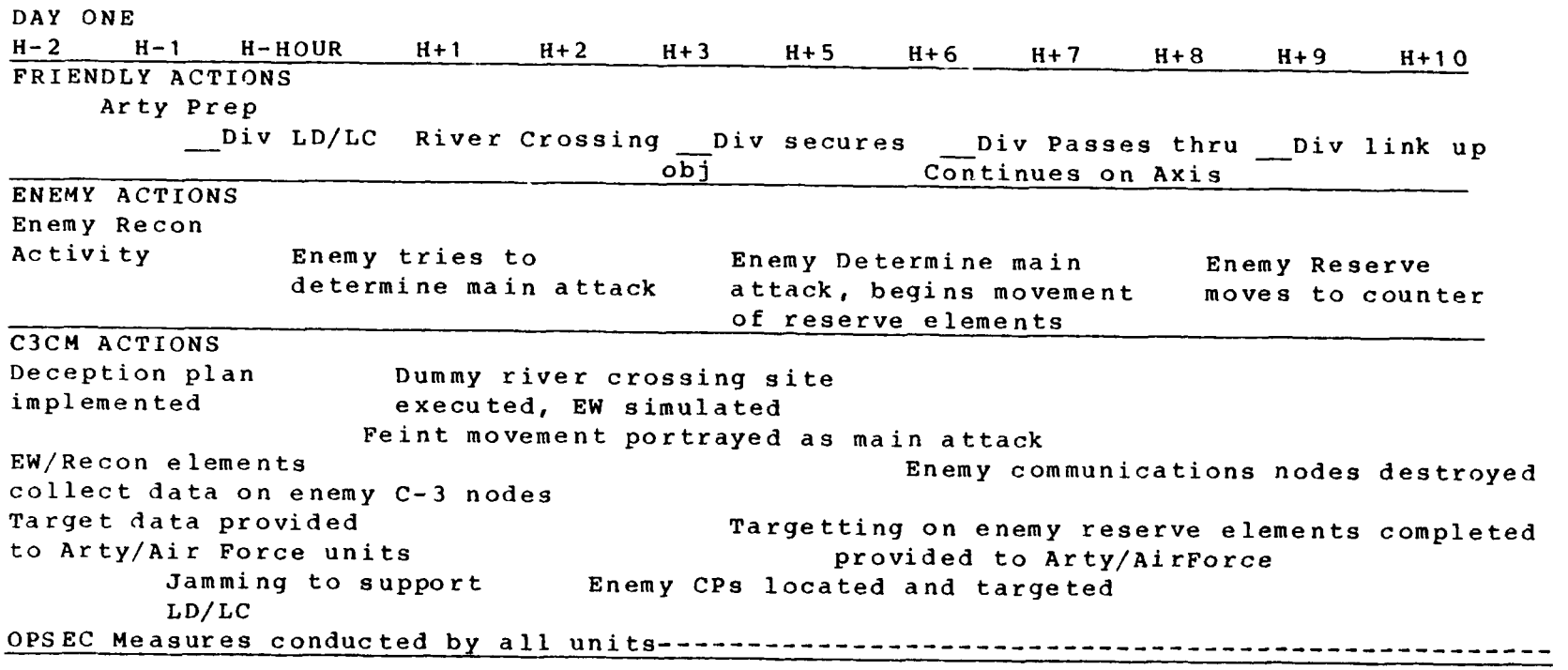
FIGURE 8

SAMPLE SYNCHRONIZATION MATRIX



Source: Department of the Army, ST 3-1, The Command Estimate, (Fort Leavenworth: July 1987), 4-12.

FIGURE 9 C3CM TIMELINE EXAMPLE FOR A CORPS OPERATION



Source: developed by author.

FIGURE 10

C3CM PLANNING MATRIX EXAMPLE

MISSION: 10th (US) Corps attacks at DTG to destroy enemy forces ____and seize OBJ ____.

ENEMY CENTERS OF GRAVITY TO BE ATTACKED: Command and Control headquarters

Target acquisition systems

Logistical lines of communications

Critical Communications systems

FRIENDLY CENTERS OF GRAVITY TO BE PROTECTED: Command and Control headquarters

Friendly force logistical bases

Friendly lines of Communications

Friendly communications network

DAY	TIME	C3CM COMPONENT	TARGET MISSION #	ELEMENT TASKED	RESPONSIBLE AGENCY	COORDINATION	RMKS
1	0400	Maneuver	Msn 1 enemy CP	Corps SOF	G-3	G-2	
				Corps Aviation	G-3/Avn Bde	G-2	
	0430	Targeting	Msn 1	Corps Artillery	G-3	FSE	
	0430	EW	Msn 1	Corps MI Bde	G-3	G-2/MI Bde	
1	0400 -2400	OPSEC	Prot LOCs	COSCOM	G-3 OPSEC	COSCOM	OPSEC Annex
1	0400 -2400	DECEPTION	Execute Deception Plan	Divisions/sep brigades	BAT-D	Divisions/ sep bdes	Deception Annex

Source: developed by author.

synchronization matrix. A separate C3CM matrix developed in conjunction with the battlefield operating system matrix wouldprovide two benefits for the planning staff. The first benefit of a separate C3CM planning matrix, would be the integration of C3CM actions within the corps tactical plan. The second benefit that would come from the development of a separate C3CM matrix is that it would provide the draft concept for the overall corps C3CM strategy and draft concept for a separate C3CM annex for the corps operations order.

The C3CM planning process can take place simultaneously within the normal corps staff planning processes. The major C3CM planning actions for an operation listed ir the following C3CM planning process, should occur within the corps decision making planning cycle.

C3CM PLANNING ACTIONS WITHIN THE CORPS PLANNING PROCESS

STEP 1: MISSION ANALYSIS

-Develop enemy C3 centers of gravity to be attacked

-Develop initial intelligence assessment

-Develop initial friendly centers of gravity that must be protected

-Develop initial specific OPSEC guidance for units

-Develop initial Priority Intelligence Requirements (PIR) to support C3CM collection

-Task EW collection assets with ESM missions to support future C3CM actions

-Develop initial counter-reconnaissance plan, task units with

counter-reconnaissance missions if necessary

-Include initial C3CM guidance in initial warning orders

-Develop initial overall C3CM strategy within commanders guidance to support the operation

STEP 2: STAFF ESTIMATES COURSE OF ACTION DEVELOPMENT

-Further refine in detail, specific enemy C3 centers of gravity to be attacked

-Refine C3CM strategy

-Develop Intelligence Preparation of the Battlefield (IPB) products that support C3CM targeting

-Review initial friendly centers of gravity that must be protected

-Begin development of an OPSEC annex

-If needed adjust initial specific OPSEC guidance for units

-Review, update initial Priority Intelligence Requirements (PIR) to support C3CM collection

-Update EW and reconnaissance collection tasking assets with missions to support future C3CM actions

STEP 3: ANALYSIS OF COURSES OF ACTION

-Include C3CM strategy as part of courses of action

-Integrate C3CM into battlefield operating system (BOS) synchronization matrix

-Refine C3CM strategy as necessary

-Use Intelligence Preparation of the Battlefield (IPB) products to develope target value analysis process

-Develop high value and high payoff target lists

-Develop C3CM High Payoff Target matrix and C3CM Attack Target Guidance matrix

-Integrate OPSEC activities into BOS synchronization matrix,

-Continue development of OPSEC annex

-If needed adjust initial specific OPSEC guidance for units

-Review and update initial Priority Intelligence Requirements (PIR) for each course of action

-Update EW and reconnaissance collection tasking assets with missions to support future C3CM actions

-Develop final counter-reconnaissance plan to support the operation

STEP 4: COURSE OF ACTION DECISION AND PREPARATION OF ORDERS

-Final C3CM strategy approved by the commander

-C3CM annex completed as part of Corps OPORD

-Deception annex completed, with C3CM tasks integrated, as part of Corps OPORD

-OPSEC annex completed, with C3CM tasks integrated, as part of Corps OPORD

-Fire Support Annex completed, with C3CM tasks integrated, as part of Corps OPORD

PLANNING THE COMPONENTS OF C3CM

An analysis of the planning of each component of C3CM is useful for the C3CM planner. Each component of the C3CM process offers the C3CM planner specific challenges and requires specific planning considerations. Planning of each component of C3CM does not take place in a vacuum, however it is important to

have an understanding of the special planning considerations of each component.

PLANNING MANEUVER IN SUPPORT OF THE C3CM STRATEGY

There are two different methods of maneuver used to support the corps C3CM strategy. The first method, in which maneuver can support C3CM, is to take direct action against an enemy command, control or communications target. Threat tactical mobile C3 systems can be made a high priority planning target at all levels. Since many threat C3 systems are usually modified standard battlefield systems, they can be easily targeted by maneuver units. Other more sophisticated C3 systems include display radars, irregular generators, optics, antennas, and differing movement patterns from the combat systems. With training, maneuver forces can learn to identify and destroy these systems as priority targets.

Maneuver against mobile C3 threat systems can provide a high payoff for friendly forces. For example, a threat commander of a motorized rifle regiment must control over 130 armored fighting vehicles, 50 tanks, 18 self propelled howitzers, engineer, reconnaissance companies, chemical, mortar, air-defense, and signal units. If the commander and other key staff members in the unit are taken out of action, the cohesion of the unit will be confused for a period of time or might completely fall apart. The over-centralized control of threat units is an exploitable weakness that should be taken into account during the planning of C3CM strategy.[4]

The planning for maneuver against threat fixed C3 facilities takes place in conjunction with the other battlefield operating systems within a synchronization planning matrix. Maneuver against fixed enemy C3 systems can be more effective than artillery or air attack. Maneuver planned against enemy C3 targets in the corps is conducted by ground maneuver units, corps air assault forces or special operations forces. The use of air assault and special operations forces against fixed enemy command and control positions add a new capability to the battlefield, which has proven effective during the recent Iraqi War between the Coalition forces and Iraq. Maneuver operations as part of the C3CM strategy during the war were particularly effective against targets that were not vulnerable to attack by air or artillery.

The second method, using maneuver planned within the synchronization matrix to support the C3CM strategy is deceptive maneuver. This type of maneuver uses a combination of two of the C3CM components. Deceptive maneuver is essentially maneuvering forces on the battlefield in such a way as to lead the enemy commander to an incorrect estimate of the situation. An enemy that suffers deception or delay in his decision making process is thrown off balance, offering friendly forces a window of opportunity and a tactical advantage. The primary means of creating deceptive maneuver is by creating a series of feints and demonstrations using combined arms forces maneuvering in close proximity to the enemy. This second method of maneuver

can also be used in combination with the first method of destruction of enemy C3 centers. A feint or demonstration could concentrate the enemy's attention away from another area, such as a flank position, while other friendly forces maneuver and attack C3 facilities.[5] Maneuver as a component of C3CM offers numerous techniques planners can employ at any level of command.

PLANNING EW IN SUPPORT OF C3CM

Electronic Warfare (EW) actions in support of the corps C3CM strategy take place during the course of action development planning in conjunction with the other battlefield operating systems on the planning synchronization matrix. The first type of electronic warfare that most planners key on when developing EW actions is jamming. However, planners should consider the entire EW package which includes the components of electronic warfare, electronic support measures (ESM), electronic countermeasures (ECM) and electronic counter-counter measures (ECCM).

Planning electronic warfare activity to support tactical C3CM operations cannot take place in isolation. EW is an activity C3CM planners use to support the other components of C3CM by collecting intelligence on enemy C3, providing target information on enemy C3, degrading enemy C3 thru jamming and deception, and protecting friendly C3. EW support to C3CM is maximized when it is planned in conjunction with the other components of C3CM. The intelligence component of signals

intelligence (SIGINT) provides support to all the C3CM components. By collecting information on enemy C3 centers using electronic support collection activities, EW sets the framework for the maneuver and targeting components of C3CM. EW provides a nonlethal attack means, electronic countermeasures (ECM), for planners to integrate into the overall C3CM strategy. Planning for jamming enemy communications in conjunction with the C3CM plan, requires careful synchronization to be effective. Jamming resources throughout the corps are limited and, if not coordinated properly, jamming efforts can be ineffective. EW assists the C3CM deception effort by portraying false friendly intentions, capabilities and dispositions. Defensive EW measures support C3CM by the use of electronic counter-countermeasures conducted by all Army communications personnel within the scope of the OPSEC plan.

PLANNING OPSEC IN SUPPORT OF C3CM

A determination of risks to the corps takes place during the evaluation of courses of action. The risks to the corps for each course of action impact on the planning of the C3CM component of operations security (OPSEC). OPSEC activities that support C3CM, planned during this phase, can be critical to the success of an operation, because they protect the corps operation and minimize the risks. OPSEC supports all the C3CM components and is primarily a C3CM protection measure: however, OPSEC also has a counter C3CM role.[6]

To support the protection of the corps C3CM strategy,

units conduct the standard operating procedures of OPSEC. Some of the standard OPSEC activities that fall within the C3CM protection role are passive measures such as camouflage, movement discipline, and communications security. Units will also execute specific OPSEC tasks that support the current tactical operation developed during the planning phase. Instructions and specific tasks to subordinate units are prepared based on the collection capability of the enemy. An example of a specific OPSEC task that would occur, is if the enemy had a new collection capability, making it necessary for different countermeasures to be taken by friendly units to avoid detection. All these activities fall under the category of defensive C3CM protection measures.

Recent developments in the OPSEC field that impact on planning are counter-surveillance and counter-reconnaissance. The aim of counter-surveillance measures is to destroy or degrade the enemy's surveillance and target acquisition activities. As part of the overall counter-surveillance effort, friendly forces conduct counter-surveillance passively using good signal security, camouflage, movement, dispersion and concealment. Counter-surveillance C3CM protection measures are not new to OPSEC; however, counter-reconnaissance C3CM measures are a new way of employing OPSEC. Counter-reconnaissance, as part of the C3CM effort, now combines the OPSEC effort with the physical destruction of the enemy's surveillance and reconnaissance capabilities, by using the C3CM components of

targeting or maneuver.

The aim of counter-reconnaissance operations is to provide security missions designed to protect our forces from enemy detection and destroy the enemy's capability to conduct further reconnaissance. Tactical counter reconnaissance as part of the C3CM strategy, denies the enemy command and control system critical tactical information about friendly forces. Counter-reconnaissance activity can provide enormous benefits to the friendly tactical force. A battle or campaign can be won or lost depending on the outcome of the reconnaissance and counter-reconnaissance operation. A 1987 Rand Corporation study from the National Training Center (NTC) provides evidence of the importance of these operations. The statistical data from the Rand Corporation study indicates that when a unit conducted good reconnaissance and counter-reconnaissance they won; when they conducted these operations poorly, they lost.[7] The data is as follows:

Deliberate Attacks

Recon status	WIN	LOSE	DRAW
Good	64%	9%	27%
Poor	6%	78%	16%

Hasty Attacks

Recon status	WIN	LOSE	DRAW
Good	100%	/%	/%
Poor	12.5%	75%	12.5%

Counter-reconnaissance

Counter-recon status	WIN	LOSE	DRAW
Good	93%	3.5%	3.5%
Poor	0%	100%	0%

PLANNING DECEPTION IN SUPPORT OF C3CM

OPSEC planning and activities set the foundation for the creation of deception plans to support the operational plan. OPSEC and deception are mutually supporting, in that OPSEC supports deception by eliminating or reducing the indicators that give away our true intentions or display our deceptive intent. Since the primary aim of deception is to influence the enemy commander, OPSEC establishes the base of secrecy that is necessary for deception to work.[8]

As part of the corps C3CM strategy, battlefield deception compliments the other components of C3CM. In the C3CM offensive role and countering enemy C3 capabilities, battlefield deception can inject false information into the enemy's decision making process. The overall effect will be to degrade the enemy's C3 capabilities, make the enemy question his intelligence collection and analysis system, and cause the enemy to make incorrect decisions. In the C3CM defensive role and friendly C3 protection, deception assists the operational security posture of the operation by masking indicators of true friendly intent. Both the offensive and defensive deception measures are planned in conjunction with the battlefield operating systems on the

synchronization matrix. In order to be effective, deception actions must develop in the framework of an overall corps C3CM strategy for the operation.

To gain a better understanding of how deception affects a battle's outcome, the U.S. Army commissioned the RAND corporation to study the results of engagements at NTC and the relationship to deception, separate from the previously mentioned counter-reconnaissance study. The Rand study suggests a strong relationship exists between deception and a successful battle. When deception is not used, the chance for a successful battle is one in seven. But, when deception is successful three out of four are successful. In 13 battles with successful deception, the friendly force had a success rate of 69.2 percent.[9]

Considering the positive results of the RAND study, the conclusions drawn seem to reflect the need to plan deception as part of every operation. Indeed deception should be a part of all combat operations, not a separate battlefield activity. Deception is not the only means to degrade the enemy command and control process. Deception must occur within the scope of an overall C3CM strategy to maximize its full potential.[10]

PLANNING OF DESTRUCTION/TARGETING COMPONENT OF C3CM

The objective of the destruction component of C3CM is to destroy, disrupt, delay or limit the C3 capabilities of the enemy which could interfere with the achievement of friendly objectives. The corps will plan the C3CM component of targeting

based on the friendly scheme of maneuver/tactical plan. The targeting of enemy C3, bases itself on a careful assessment of enemy C3 capabilities and a determination of which C3 targets are high payoff targets (HPTs). Upon completion of the mission analysis, the corps fire support element develops a prioritized list specifying what targets to acquire and attack, and what weapon system is necessary to defeat the target. The targeting process for each target ends with the final destruction of that target. The targeting methodology that supports the corps C3CM strategy is characterized as: DECIDE-DETECT-DELIVER.[11]

The planning associated with supporting the targeting of C3CM requires close coordination between the commander, intelligence and operations staffs, and fire support element. Within the corps command post a targeting cell forms to support the targeting effort. The targeting cell has two primary functions: first, the targeting cell synchronizes the close, deep and rear area operations targeting effort; second, from this analysis, the targeting cell determines targets for acquisition and attack. The targeting cell uses Target Value Analysis (TVA), which identifies potential high value targets (HVTs) within the scope of the friendly situation.[12]

Target value analysis produces a high payoff target matrix and an attack guidance matrix. While courses of action are being wargamed on a synchronization matrix by the planners, the target analyst develops target lists from intelligence templates. The target lists provide the target attack strategy

for each specific course of action. The intelligence situation template and decision support template (DST) provide the target analyst the integrated information on terrain, weather, enemy doctrine, and expected enemy actions. After determining the high payoff targets, target analysts from the fire support element and intelligence section develop the high payoff target matrix and attack guidance matrix as planning tools to disseminate information to the other staff sections within the command post.[13] These two matrixes form a guide for collection and attack coordination during the operation. An example of a high payoff target matrix that would support a C3CM strategy in a specific operation is shown in figure 11. The attack guidance matrix that is developed from the target HPT matrix is displayed in figure 12.

C3CM AND THE COURSE OF ACTION DECISION

After the corps commander decides on a course of action developed from the planning process, the chosen course of action evolves into a final concept of operation. The staff prepares the necessary plans and orders based on the commanders decision. At this point, the planning cycle is complete. However, the elements of the C3CM strategy are usually within the multiple annexes of the corps operations order. To properly synchronize the components of C3CM, the corps operations order needs a separate C3CM annex strategy. A separate C3CM operations order annex would have the following elements:

FIGURE 11 EXAMPLE OF C3CM HIGH PAYOFF TARGET MATRIX

PRIORITY	CATEGORY	SHEET NUMBER	DESCRIPTION
1	1 (TS)	77,79	Front Main CP
2	3 (TS)	80,81	Army Main CP
3	3 (TS)	82,83	Army Rear CP
4	4 (TS)	84,85	Division Main CP
5	3	86,87	Army Artillery Command Btry
6	4	88,89	Division Artillery Command Btry
7	7	90,91	AD, EW, Site, Radio Radar Intercept sites
8	8	92,93	Regimental Main CP

PRIORITY: Priority assigned based on target value, order of occurrence, ability to engage, ability to defeat, ability to locate, and degree of accuracy.

CATEGORY: Category is the type target to be attacked.

SHEET NUMBER: Sheet number is a cross reference to High payoff target list developed during planning.

(TS) Time sensitive.

FIGURE 12 EXAMPLE OF C3CM ATTACK GUIDANCE MATRIX

CATEGORY	HP	WHEN	HOW	DESCRIPTION
1 (TS)	77,79	day one	artillery, air	Front Main CP
3 (TS)	80,81	day one	artillery, air	Army Main CP
3 (TS)	82,83	day one	artillery, air	Army Rear CP
4 (TS)	84,85	day one	artillery, air	Division Main CP
3	86,87	day one	artillery, air	Army Artillery Command Btry
4	88,89	day one	artillery, air	Division Artillery Command Btry
7	90,91	day one	artillery, air	AD, EW, Site, Radio, Radar Intercept sites
8	92,93	day one	artillery, air	Regimental Main CP

Source for figure 11 and 12: Department of the Army, Field Manual 34-118, The Targeting Process, draft, 1987.

- What the C3CM strategy for the operation will be,
- the objectives of the C3CM strategy,
- how the C3CM strategy is to be implemented,
- tasks specific units with C3CM activities required,
- establishes responsibility for all C3CM activities,
- provides for a process to evaluate the progress of C3CM actions.

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[1]U.S. Army, FM 100-15, Corps Operations (Washington: Department of the Army, 1988), 4-11.

[2]Ibid, 4-13.

[3]U.S. Army Command and General Staff College, ST 100-9, The Command Estimate, (Fort Leavenworth, Kansas: July 1989) 4-4.

[4]Charles H. Hill, "Target the Leaders," The Army Communicator Magazine, (Fall 1983), 25.

[5]U.S. Army FM 90-2, Battlefield Deception (Washington: Department of the Army, 1988) 3-2.

[6]FM 100-15, (1988), 4-25.

[7]Department of the Army, U.S. Army Center for Lessons Learned, Reconnaissance and Counter-Reconnaissance, (Fort Leavenworth, Kansas: 1990), 8.

[8]FM 90-2, (1989), 1-32.

[9]Justin L.C. Eldridge, "The Myth of Army Tactical Deception," Military Review, (August 1990): 70-71.

[10]Ibid.

[11]U.S. Army, FM 6-20-30, Fire Support for Corps and Division Operations, (Washington: Department of the Army, 1989), 4-8.

[12]Ibid, 4-9.

[13]Ibid.

CHAPTER 5

C3CM REQUIREMENTS

The execution of a C3CM strategy places special challenges on a tactical fighting force. Due to its very nature, C3CM is technology intensive and requires well trained soldiers and leaders to manage the complex C3CM planning process. The future battlefield will require the U.S. Army to have a well developed tactical command, control, communications and intelligence (C3I) system to plan and control established C3CM procedures. The future automated Army C3I that supports C3CM operations will need highly trained personnel, not only skilled on use of hardware, but also skilled on employment of all the battlefield operating systems. C3CM will require a well developed and responsive intelligence system to provide the information needed to execute the C3CM strategy. This chapter will look at how the Army is meeting the requirements of C3CM and the actions needed to overcome shortfalls.

THE NATURE OF C3I AND RELATIONSHIP TO C3CM

According to the U.S. Army Corps Operations Field Manual, "to be successful C3CM is dependent on effective procedures established and practiced."[1] Execution of C3CM must be in

conjunction with an effective command and control and intelligence (C3I) system and proper operating procedures. The evolution of command, control, and communications (C3I) is closely intertwined with C3CM. Each part of C3I, like the functions of C3CM, work in conjunction with the others simultaneously. An understanding of C3I and its components is important for a staff planner. C3I encompasses a range of operations and equipment.[2] Command is a dynamic process, involving the interaction of personalities with events as they unfold. Control is the supervision of subordinate commands, within broad directives, allowing subordinate commanders the freedom of action to run the battle with a minimum of interference. Communications is the foundation of the whole process that ties the elements together. Intelligence is the gathering, processing, collating and distri ution of information to support the process.[3]

C3I is described as the meshing of Command and Control (C2) functions with two sets of systems, C2 functions and C2 systems, that allow performance of C2 tasks. The C2 functions are:

monitoring enemy troop strengths and resources;

monitoring friendly troop strength and resources;

planning targeting scenarios;

planning electronic warfare scenarios;

choosing tactical and operational options;

facilitating execution of selected options;

assessing and controlling military capabilities;

reconstituting and redirecting forces;

evaluating attack damage;

conflict termination.

The C2 systems that control C2 functions are:

communications systems that connect forces with required data;

information-gathering and processing systems.[4]

THE CORPS COMMAND AND CONTROL STRUCTURE

The current command and control structure is built around three command posts. The tactical command post concentrates on the close battle. The main command post synchronizes the battlefield operating systems by concentrating on the deep battle and planning future operations. The rear command post concentrates on the corps rear battle operations, terrain management, sustainment and administrative operations. For the purposes of planning C3CM, the focus for this analysis is primarily on the main command post structure.

The main command post is a very large organization with significant mobility and signature problems. The corps main command post consists of functional cells massed in one location, or dispersed over a wide area. The framework for the specific cells found within a corps main command post are: the command cell, combat service support cell (CSS), current operations cell, plans cell, intelligence cell, fire support cell, and communications cell. Some of the corps control cells can employ well over 200 personnel and up 100 vehicles.[5] An

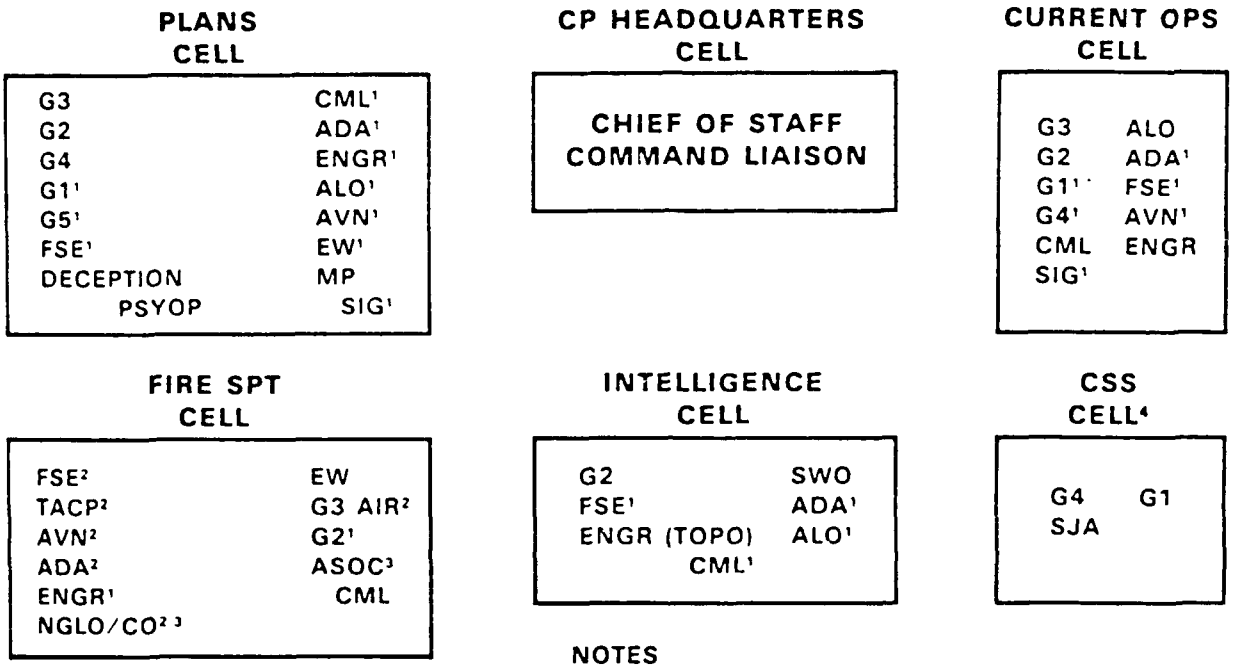
example of what the cells are and the personnel recommended for each cell, by the Corps Operations Field Manual, is displayed in figure 13.

When considering where C3CM planning should take place there is no doctrinal manual, which indicates where the C3CM functions occur within the main command post. The personnel organizations that currently exist in the corps structure that support C3CM planning are the G-3 Plans Cell, Corps Battlefield Deception Element, the Corps OPSEC section, the Corps Electronic Warfare Section, and the Corps Fire Support Element. Every component of C3CM has an organization that can plan C3CM activities within the scope of its specific discipline. The overall C3CM concept for an operation should be developed within the G-3 plans section to provide direction to the organizations that plan and execute the components of the C3CM strategy.

C3CM planning should take place within the G-3 plans cell of corps main command post, because responsibility for C3CM planning and synchronization is under the G-3. Reviewing the personnel manning outlined for the plans cell in figure 13 it becomes evident that most of the personnel needed to conduct C3CM planning are available in the plans cell. Missing from the personnel required for C3CM planning in the plans cell is the OPSEC section. There is no standardized method for manning the plans cell other than what the U.S. Army Corps Operations field manual recommends. Every corps planning cell throughout the Army is different. Along with the lack of a standard personnel

FIGURE 13

CORPS MAIN COMMAND POST CELLS



NOTES

1. MAY NOT BE PHYSICALLY LOCATED IN THIS CELL ON A CONTINUOUS BASIS, BUT PROVIDES INPUT/INFO AS REQUIRED.

2. ALSO WORKS AS PART OF THE CORPS A^2C^2 ELEMENT UNDER THE SUPERVISION OF THE CURRENT OPS CELL FOR PERFORMANCE OF A^2C^2.

3. AS REQUIRED.

4. FORMED AS A SEPARATE CELL ONLY WHEN IN MASSED CP CONFIGURATION. WHEN USING DISPERSED CP CONFIGURATION, ELEMENTS ARE ABSORBED BY CURRENT OPERATIONS AND PLANS CELLS TO REDUCE LIFE SUPPORT, COMMUNICATIONS, AND SECURITY REQUIREMENTS.

Source: Department of the Army, FM 100-15, Corps Operations, (September 1989), 4-9.

structure, there is no set structure for the physical layout and equipment requirements for the plans cell. The combination of no standard personnel and equipment structure for a corps planning cell can be a major distraction in planning C3CM operations. The lack of a standardized structure also detracts from establishing set procedures to maximize synchronization of the battlefield operating systems and C3CM.

The lack of a standard organization within the plans cell in the corps main command post, impacts on the unity of effort required to synchronize C3CM operations. The complexity of synchronizing C3CM requires standard procedures, set personnel requirements, and standard physical layout to be successful. Without a clear definition of the roles of each cell within the command post and the function of the personnel within each cell, much energy is lost sorting out who does what, to whom and when. In the case of a main command post not conducting a command and control exercise over an extended period, when that command post deploys, it can take up to several days for the personnel within a cell to figure out what their job is and how to accomplish it.

The standard command post (SCP) effort started by the U.S. Army Combined Arms Center at Fort Leavenworth was an initiative that attempted to solve the command and control structure problems within the Army. Currently there are significant differences between each corps main command post throughout the Army. The differences of individual corps

missions have been the main reason in defense of maintaining the status quo. In reality there are more similarities to corps requirements than differences. The bottom line for a main command post to be effective is that it must be able to synchronize combat operations and plan future ones focusing on the seven battlefield operating systems and survive. The SCP program attempts to concentrate on the common battle focus roles of the cells within the command post and provide a realistic structure for future command posts.[6]

The SCP program experiments and tests standardized command post concepts in the field using actual corps and division command posts during exercises. However, the attempts to produce a standardized command post structure may not produce what is essential. The standardization required, within the corps plans cell, to conduct synchronized C3CM activities may be too revolutionary for the Army. Logical and objective answers to the standardized command post are not forthcoming from field units. Standardization will cause many units and commanders to make significant cuts or reorganizations within their command posts.[7] Many commanders and senior staff officers are comfortable with their current command post organization. The innovations and changes required to standardize command posts will not disappear. When a standardized personnel and equipment structure is finally recognized and implemented, proper and more effective C3CM procedures and planning will follow.

AUTOMATION AND C3CM

In modern warfare the multitude of sensors used for surveillance, target acquisition, and reconnaissance produces such a vast amount of information that it is impossible for humans to analyze it quickly enough. The basis of future warfare will be the ability to communicate thousands of messages per day and quickly make sense of it all. It is essential therefore, that the raw data undergo computer analysis, and provide a usable format for military operations.

C3CM automation requirements for planning and execution will create additional responsibilities for military automation systems. C3CM systems and procedures are closely connected to time, the most vital factor on the technological battlefield. C3CM can be potentially the decisive element on the battlefield by providing the critical window of opportunity to a commander. Modern automated C3I and fire control systems, operating on a real time basis, can predict what the enemy will do 24-96 hours ahead, by plotting, analyzing and exploiting his movements. The flow of accurate up-to-date intelligence could enable a commander to launch a counter movement with deadly precision, and drive for the critical point of an enemy penetration well before the enemy could react.

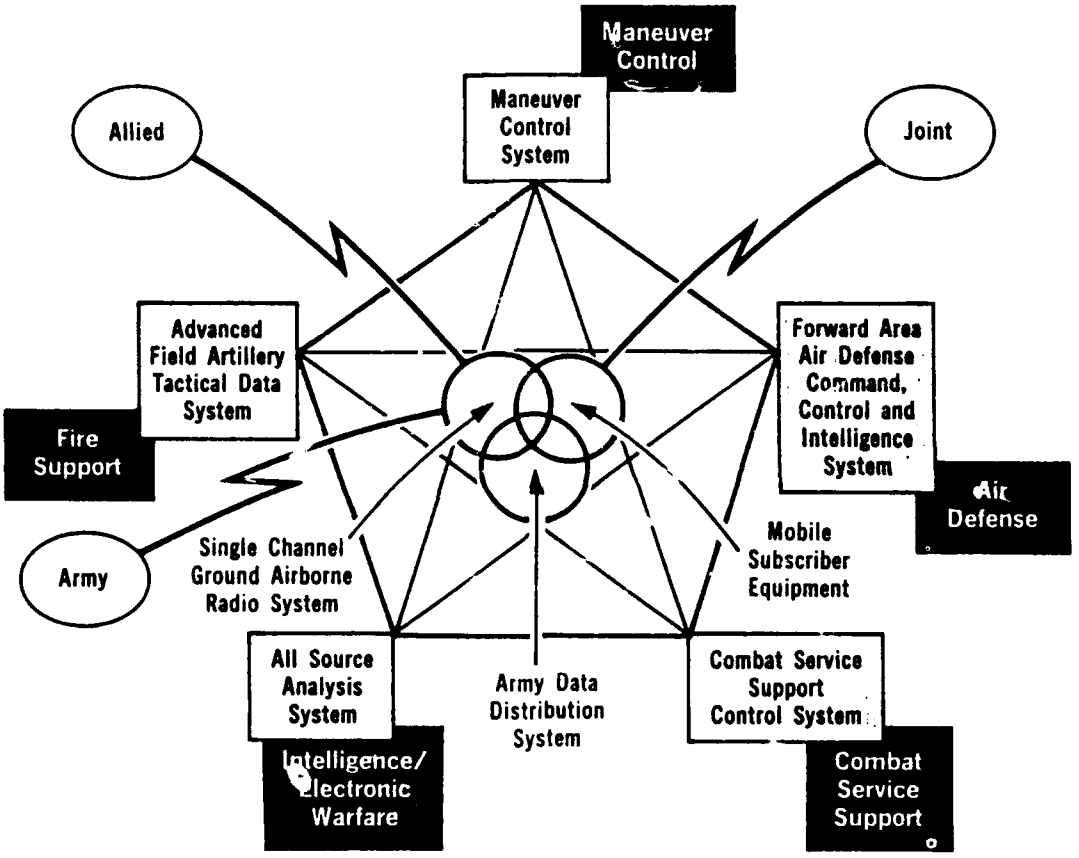
A well developed automated C3I system will be an important force multiplier during future warfare. Both the U.S. and U.S.S.R. have recognized the importance of modern automated C3I systems. The U.S. spends about $30 million annually on

automated tactical communications, electronic warfare and intelligence. The U.S. Army is placing priority on developing an automated C3I system, the maneuver control system (MCS) and the all source analysis system (ASAS), to allow a tactical commander access to a vast range of information and capabilities. Soviet forces have placed heavy emphasis on the automation of C3I. In 1980 the Soviet forces began employing a third generation of command and control computers based on the Ryad series developed in Eastern Europe. This system has been deployed down to tactical divisional level. The divisional commander is now able to use a data retrieval system linked with higher front and theater level systems. The Soviet systems have been operational since the mid 1970s whereas the NATO systems are just recently coming on line.[8]

The Army tactical command and control system (ATCCS) at corps and below integrates the battlefield automation system. The ATCCS is oriented on five functional areas or systems, each with its own functional automated command and control system. Figure 14 displays the ATCCS structure to include the present and planned automated command, control and communications systems. Of the five automated systems in ATCCS three impact on C3CM operations, they are the Maneuver Control System (MCS), Advanced Field Artillery Tactical Data System (AFATDS) and the All Source Intelligence System (ASAS). The three systems of the ATCCS system, that support C3CM, will play a significant role in planning and synchronization.

FIGURE 14

The ARMY TACTICAL COMMAND AND CONTROL SYSTEM (ATCCS)



The Army Tactical Command and Control System (ATCCS)

Source: Wayne Knudson, Maj Gen. U.S. Army, "The Future of C2," Military Review, (July 1990), 23.

The Maneuver Control System (MCS) is the G-3 focal point for automation support in tactical operations. MCS has been fielded to III Corps units in a field validation test and its development continues to grow with technological advancements.[9] The MCS system will plan the maneuver, OPSEC, and deception components of C3CM in the future. MCS will also be the system used by the G-3 plans section for overall synchronization on the battlefield.

The All Source Analysis System (ASAS) is the G-2 automated intelligence support system. ASAS will be in constant use receiving, storing, retrieving and processing intelligence data assisting staff planners in support of the decision making process. The ASAS system integrates weather, terrain and enemy, and produces intelligence preparation of the battlefield (IPB) analysis and products. It will assists with C3CM collection requirements and the intelligence section by identifying intelligence collection requirements and directing activities. By processing input from national, theater and tactical sources and systems, the ASAS system will help integrate the corps C3CM plan with the theater C3CM plan. After collection of information, the ASAS system will conduct analysis, intelligence production and dissemination of final products.[10] A limited configuration of ASAS was fielded at Fort Hood, Texas in 1989 and the system is continuing to grow with the changes brought on by technology.[11] ASAS will provide the intelligence support critical to C3CM operations. Interfacing with the MCS system,

ASAS can synchronize the EW component of C3CM. ASAS will also interface with the AFATDS system to synchronize the targeting component of C3CM. ASAS provides automated support to C3CM target planning and assist in the target value analysis process.

The Advanced Field Artillery Tactical Data System (AFATDS) will plan, coordinate and direct fire support from Army and joint weapon systems in support of the tactical commander. AFATDS production testing will take place in 1994.[12] The AFATDS system will be key to synchronizing the targeting component of C3CM. In the future, by interfacing with MCS and ASAS it will provide the link between the target value analysis process conducted by the intelligence section and target attack guidance from the G-3 and commander necessary to attack C3CM targets.

The automation support necessary to synchronize C3CM in the future is not yet available. Even when the systems required are finally fielded, established procedures on the use of automation to support C3CM may take considerable time to establish. Similar to personnel and equipment used in the command post today, the automated systems developed to support planning and C3CM have no established organizational structure for placement within the command post. The physical placement and use of automated systems fielded to corps command posts varies in accordance with the number of corps command posts in the Army. The automation of corps C3I is not the final answer, old ways of coordination and synchronization of the battlefield

will require review and probable update to maximize the capabilities that automation will provide to the planning and execution of C3CM.

TRAINING AND C3CM

Training Army personnel to plan and conduct C3CM operations is not a simple task. The coordination required to conduct C3CM requires personnel who can concentrate on thinking beyond the boundaries of inflexible procedures. C3CM requires that we continuously refine our assessment of enemy actions and modify our own plans to best advantage. This training cannot occur if it only follows a regimented system, and standard procedures. Effective C3CM will require the planner to go beyond the set procedures that provide only a guide on how to conduct C3CM, but to develop a C3CM strategy for his particular situation.

The Army currently conducts C3CM training in a diverse manner. Personnel from all disciplines take part in planning and conducting C3CM; however, each separate discipline trains personnel on only one aspect of C3CM. Thus, each component of C3CM trains separately from the other. There is no overall proponent for C3CM within the Army that can coordinate the training effort. As a result, each school that conducts training on C3CM only focuses on one aspect. Since C3CM is not taught as a complete unit, the training that takes place within the Army school system does not address the needed training as a total synchronized package. The C3CM aspects of maneuver and

OPSEC do not have any formal institutional base in the Army training system. As a result, formal C3CM training throughout the Army lacks the same unity of effort on which C3CM procedures and organization are dependent. The following figure 15, displays each component of C3CM, which organization within a command post plans and controls it, and what proponent of the Army school system is responsible for the training. Figure 15 provides some insight into how the C3CM training effort is split among the Army training and doctrine organizations.

The Army must expand the knowledge base of planning and executing C3CM. Previously C3CM was done by a small group of planners within the corps command post. The primary means of training corps staffs in C3CM techniques is through field training. Involving the different disciplines in the C3CM process during field training exercises improves the planning and execution of C3CM. This training void can be overcome by including planning and execution of C3CM activities in exercise goals. Until recently the Army did not have any program to train corps staffs on their synchronization skills. The Battle Command Training Program (BCTP) provides a framework that exercises corps command and control. The scenarios used for BCTP require an in-depth IPB which identifies enemy artillery and C3 centers. BCTP trains corps staffs how to develop a deception plan, to include feint attacks that activate enemy artillery, aircraft, electronic warfare and C2 systems. Targeting and maneuver serve to keep the enemy off balance

FIGURE 15

TRAINING AND ORGANIZATIONAL RELATIONSHIPS OF C3CM

C3CM COMPONENT	ORGANIZATION WITHIN CORPS CP	TRAINING PROPONENT
MANEUVER	G-3 section	Combined Arms Center
DECEPTION	Battlefield Deception Element	Combined Arms Center
OPSEC	G-3 OPSEC Section	Trained in Units
EW	G-3 EW Section	Intelligence School
LETHAL/ TARGETING	Fire Support Element	Artillery School

Source: developed by author

while systematically destroying the enemy before he realizes what is happening.[13] All these components of C3CM are exercised by the BCTP program. The benefits gained in developing C3CM procedures in a corps BCTP exercise are extensive. To be successful the corps planning staff has to develop a synchronized C3CM plan that supports the corps commanders objective. Through the simulation the corps staff learns which procedures work well and which procedures need more work or elimination.

A field exercise is only one aspect of the training required for C3CM. As soon as a staff planner in a corps learns how to synchronize C3CM, he moves to another assignment. A more diverse approach within the Army school system is necessary for C3CM. Instead of the narrow, one disciplined view of training staff planners, a broad approach that exposes future staff planners to staff training which includes the planning and synchronization process of C3CM is needed. Field training can make a significant contribution to fill the C3CM training void; however, it cannot fill all the training requirements of C3CM. The Army school system should embrace the concept and integrate it into all staff training.

C3CM COMMUNICATIONS REQUIREMENTS

Corps C3CM requires a common user communications system that can meet extensive demands. The communications system must support the commanders decision making process, multiply the dynamics of combat power, and support future tactical

innovations.

The Army is currently fielding the new Mobile Subscriber Equipment (MSE). MSE is a dramatic change in Army communications, replacing older switchboard, multichannel and communications centers at division and corps. MSE will provide a vast phone network for C3CM planners to coordinate and synchronize activities throughout the corps sector. Each division will have 175 mobile tactical phones and 500 fixed phones throughout the division area. Each corps will have 800 mobile tactical phones and 3,500 fixed phones throughout the corps area. The phone system also allows facsimile and data communications.[14]

The MSE system offers significant advantages over the previous Army tactical communications systems for C3CM planners. Staff functions and the decision making process will improve significantly under MSE because the flow of information in and out of command posts will be more timely and reliable than provided by previous systems. Facsimile communications assists in the transmission of graphics and orders for planning and execution of an operation. More rapid distribution than that provided for in the past, will allow planners more time to synchronize the battle. Using previous communications systems, corps command posts provided a large massed target for enemy targeting systems. Survivability of command posts will be increased by using the MSE capability to provide for more dispersed operations of command post cells.[15]

MSE's greatest contribution will be the flexible, mobile, reliable support it provides to future Airland battle concepts. MSE will support the Airland Battle Future (ALBF) concept that will operate on a fluid battlefield. Maneuver units can remain highly mobile without losing communications support. MSE will provide significant OPSEC protection to command posts by remoting the electronic signal away from the C2 center and providing secure communications. The MSE system directly supports the C3CM components of maneuver, OPSEC and electronic warfare and provides connectivity for the entire C3CM strategy.

The full assessment of MSE is not complete. There are still some problems to be worked out within the system. The major problem MSE has in supporting C3CM, is in providing support to C3CM intelligence communications requirements. The intelligence system is dependent on moving large amounts of information in automated formats. MSE has not developed a method to transmit data in a continuous manner to multiple subscribers. The need to transmit data thru the MSE system in an efficient manner is a problem that, if not resolved, will inhibit the C3CM process. Specifically the information needed to conduct target analysis that comes from automated sensors into computer analysis systems slows significantly. Until the data transmission problems improve within the MSE system, the intelligence community will have to rely on interim communications systems that fill the intelligence requirements.

INTELLIGENCE SUPPORT TO C3CM

As one of the foundation pieces of the C3CM concept, intelligence support sets the stage for the execution of the entire C3CM strategy. During the planning stage intelligence needs to provide information of enemy C3 system so a coherent C3CM strategy can be formed. If the intelligence information is flawed, then the entire C3CM strategy is doomed to failure.

When a C3CM strategy is in the planning stage, there is a need for intelligence on enemy C3 dispositions to include, command posts, fire control elements, and communications centers along with an analysis as to which element is critical to enemy operations. Intelligence support available at the corps command post is the primary level of tactical command that can provide the critical node analysis used for further target value analysis.[16] This will ensure proper use of all targeting assets in support of the C3CM effort. For example, the corps should not waste a valuable bombing asset on a well protected target when artillery or electronic warfare can meet the C3CM goal.

The C3CM planner must develop the intelligence support throughout the entire process. After assigning a target for destruction or disruption, the C3CM planner must have a method to evaluate the results of the action. The effectiveness of measuring C3CM actions is difficult. Measuring the effectiveness of jamming, deception or OPSEC, requires intelligence resources to analyze enemy activities to gauge

reaction. The need for accurate assessment places an additional burden on the intelligence system.[17]

The only solution to providing the intelligence support needed for C3CM planning in the Airland Battle Future concept will be more effective application of automation with intelligence requirements, information and products. The requirement for development of intelligence collection plans to support a corps C3CM strategy cannot wait on a time consuming manual system. If corps intelligence cells continue to produce collection plans and priority intelligence requirements (PIR) without automation assistance, the collection plans will be out of the enemy's decision making cycle. The information the corps collects will be historical. If a corps continues to use manual posting and analysis of information to produce the information products to support C3CM, the targeting value analysis process will be ineffective.

RELATIONSHIP OF C3CM REQUIREMENTS

A well established C3I system to support C3CM requires well trained personnel with automation and established procedures to synchronize C3CM. The corps command post must have an organization and physical structure that supports the C3CM planning process. The intelligence systems to support C3CM sets the pace for the entire C3CM planning process. If any of the C3CM support elements are missing, planning and executing C3CM will not be done efficiently. The Army is making progress on some these areas, but more effort is required to realize the full potential of C3CM.

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[5]FM 100-15, (1988), 4-5.

[6]Kenneth A. McDevitt, "Why Standardize Command Posts?," Military Review, (July 1990): 56.

[7]Ibid, 57.

[8]Chris Bellamy, The Future of Land Warfare, (New York, St. Martin's Press, 1987), 256-257.

[9]Peter A. Kind, "Army Tactical C2 System," Military Review, (July 1990): 38.

[10]William E. Harmon and Richard B. Webb, "Evolution and Progress: The All Source Analysis System/Enemy Situation Correlation Element," Signal, (December 1987): 25-26.

[11]Kind, 39.

[12]Ibid.

[13]Thomas D. Morgan, "BCTP: Training Leaders," Military Review, (July 1990): 42-44.

[14]Fred E. Dierksmeier, "The Impact of MSE," Military Review, (August 1987): 44-45.

[15]Ibid.

[16]Paul H. Martin, "Intelligence Support to C3CM," Signal, (December 1987): 19-20.

[17]Ibid, 21-23.

CHAPTER 6

ANALYSIS AND CONCLUSIONS

Corps command, control, and communications countermeasures (C3CM) is a developing concept. It is difficult to define what C3CM is, since the concept is still evolving. Army field manuals and joint doctrinal writings do not fully clarify the definition of C3CM. The original C3CM concept was a good starting point; however, technology has changed that concept of C3CM. It is no longer a supporting technique used by planners to assist an operation, as the Iraqi War has proven, it has become a significant primary method in the conduct of warfare.

Due to the major changes taking place within the U.S. Army doctrine, C3CM may provide some answers to future doctrine writers on how future warfare will be fought. Applied military technology seems to be nearing perfection in accuracy. Constant update of military tactical procedures and their applications in combat are necessary to take advantage of technology. The future battlefield will depend less on sheer quantity, and more on quality and efficient procedures. C3CM in the future will provide tactical commanders a decisive means in which to apply

the indirect approach to warfare. If technological systems that can support C3CM activities progress at the present rate, the point will be reached where battles could possibly be won before they have even begun. C3CM will provide the ability to tactical commanders to paralyse the enemy and unhinge his defense or destroy his offensive momentum.

The evolution of C3CM within the U.S. Army should continue to keep pace with both technology and lessons learned from recent conflicts. The C3CM concept cannot be limited to generalized terms. The original concept that breaks C3CM down into EW, OPSEC, destruction and deception should expand with technology and lessons learned from recent conflicts. The destruction component of the original C3CM concept has proven to be too vague. The destruction component actually has two components, maneuver and targeting, that should be separated as two new components. The primary C3CM support elements of communications and intelligence have grown in importance. Added to the C3CM support requirements are command and control and training. Thus, the C3CM concept is dynamic and changing, and will require continued evaluation and updating.

Maneuver as an additional component of C3CM offers numerous techniques planners can employ at any level of command. There is no limit to the use of maneuver in future battle as a result of the rapidly increasing means by which it can be employed. However, planners should be careful not to lock themselves into a set technique that becomes predictive to

the enemy. Future employment of maneuver in a C3CM strategy will require creative techniques to counter enemy C-3. In addition, rapid technological change can make obsolete a technique that is currently in use. Therefore, a search for innovation within the planning staff needs constant consideration. A possible criteria for evaluation of future operations could possibly be whether or not the plan is innovative in its approach to the objective.

Support requirements for corps C3CM are significant, but must be addressed, to properly plan and synchronize C3CM. The intelligence, communication and command and control requirement within a corps main command post for C3CM needs a well developed automation support system, established procedures, and C3CM planning organization. Highly trained personnel who understand the entire C3CM concept and know how to plan and execute a C3CM strategy, will be critical to its success.

The Army is making progress on C3CM requirements. The ATCCS concept will deliver to the Army the automation support in the future that can properly support C3CM. MCS will provide the command and control automation needed for the G-3 planner to synchronize C3CM. ASAS will provide the intelligence support C3CM requires to target enemy C3 assets. AFTADS will execute the C3CM targeting plan for the fire support element. MSE, a major step in communications capability, will assist planners in synchronizing a C3CM strategy. These programs will create an efficient system in which a C3CM planner can produce a

synchronized plan.

There are problem areas the Army must correct in order to create a corps C3CM system. The major problem the Army should address is development of a corps C3CM architecture that integrates the C3CM concept with a corps planning structure to produce a synchronized C3CM strategy. In order to create a corps C3CM planning architecture the following actions need to occur, the C3CM concept needs update, the corps planning cell organization needs to include all the C3CM component planning elements, along with automation and integration of procedures into C3CM planning, and Army institutional and unit training in C3CM planning needs to be developed.

The Army needs a C3CM planning architecture that integrates the C3CM concept with the requirements of a corps planning cell and produces a synchronized C3CM plan to counter the enemy C3 systems. In figure 16, a visual summary of a corps C3CM planning architecture attempts to combine the updated C3CM concept with the current corps planning organization to produce a corps synchronized C3CM strategy for an operation. The proposed C3CM architecture uses the expanded C3CM definition, formed within chapter two, and integrates it into the entire planning process. The support requirements of C3CM, previously discussed in chapter five, integrate along the entire planning process. This proposed architecture is one method the Army could use to develop synchronized C3CM plans within a corps command post.

Figure 16

CORPS C3CM PLANNING ARCHITECTURE

SUPPORT TO C3CM ARCHITECTURE

INTELLIGENCE SYSTEM:
TARGET DEVELOPMENT → TARGET SELECTION → TARGET ASSESSMENT

COMMUNICATIONS SUPPORT:
PLAN DEVELOPMENT COORDINATION/SYNCHRONIZATION → PLAN DISSEMINATION → SUPPORT C3CM PLAN EXECUTION

TRAINING:
AUTOMATION TRAINING AND C3CM SYNCHRONIZATION PROCEDURES → TRAINING → SUPPORTS C3CM EXECUTION

COMMAND AND CONTROL:
PROVIDES DIRECTION AND EXECUTION OF C3CM STRATEGY

Source: Developed by Author

A need exists for a tactical corps C3CM concept to counter sophisticated threat C3 systems. Recent experiences have proven that first priority in future warfare is countering enemy C3. The proposed corps C3CM architecture developed from this thesis will be the first necessary step toward synchronizing future corps C3CM plans.

APPENDIX A

APPENDIX A

LIST OF TERMS AND OPERATIONAL DEFINITIONS

ATCCS -- The Army tactical command and control system (ATCCS) at corps and below integrates the battlefield automation system. The ATCCS is oriented on five functional areas or systems, each with its own functional automated command and control system.

ASAS -- The All Source Analysis System (ASAS) is the G-2 automated intelligence support system. The ASAS system integrates weather, terrain and enemy, and produces intelligence preparation of the battlefield (IPB) analysis and products.

AFATDS -- The Advanced Field Artillery Tactical Data System will plan, coordinate and direct fire support from Army and joint weapon systems in support of the tactical commander.

C3CM -- Command, Control, and Communications Countermeasures are the actions taken to protect friendly C3I systems and counter those of the enemy.

C3CM structure -- For this thesis I will define this term as the process and organization that Army planners at corps and division level use to conduct C3CM.

Combat Information -- Unevaluated data gathered by or provided directly to the tactical commander that, because of its highly perishable nature or the criticality of the situation, cannot be processed into tactical intelligence in time to satisfy the user's tactical intelligence requirements.

Combat Intelligence -- That knowledge of the enemy, weather, and geographical features required by a commander in planning and

conducting combat operations. It is derived from the analysis of information on the enemy's capabilities, intentions, vulnerabilities, and the environment.

Communications Intelligence (COMINT) -- Technical and intelligence information derived from foreign communications by other than the intended recipients.

Communications Jamming -- Electronic measures taken to deny the enemy the use of communications means.

Deception -- The process of misleading or confusing the enemy decision maker by distorting, concealing, or falsifying indicators of friendly intentions, capabilities, or dispositions.

Electronic Counter - Countermeasures (ECCM) -- That division of electronic warfare involving actions taken to ensure friendly effective use of the electromagnetic spectrum despite the enemy's use of electronic warfare (EW).

Electronic Countermeasures (ECM) -- Actions taken to prevent or reduce the enemy's effective use of the electromagnetic spectrum. Includes jamming and electronic deception.

Electronic Warfare (EW) -- The use of electromagnetic energy to determine, exploit, reduce, or prevent hostile use of the electromagnetic spectrum and to ensure friendly use thereof.

electronic warfare support measures (ESM) --Actions taken to search for, intercept, locate, and identify enemy electromagnetic energy sources for the purpose of employing tactical friendly forces or exploitations for intelligence

purposes.

High Payoff Target (HPT) -- High value targets (HVTs) which, if successfully attacked, would contribute substantially to the success of our plans.

High Value Target (HVT) -- A target whose loss to the enemy can be expected to contribute to substantial degradation of an important battlefield function.

Human Intelligence (HUMINT) -- includes all information derived through human sources. Tactically, it is represented by exploitation of enemy prisoners of war (EPW) and documents, long-range patrols, observation posts (OP), liaison with local military or paramilitary forces, and, most importantly, reports from friendly troops.

Imagery Intelligence (IMINT) -- Intelligence derived from imagery produced by radar, infrared, and photographic sensors generally carried by overhead platforms.

Intelligence -- The product resulting from the collection, evaluation, analysis, integration, and interpretation of all available information concerning an enemy force, foreign nations, or areas of operations and which is immediately or potentially significant to military planning and operations.

Intelligence Preparation of the Battlefield (IPB) -- A systematic approach to analyzing the enemy, weather, and terrain in a specific geographic area. It integrates enemy doctrine with the weather and terrain as they relate to the mission and the specific battlefield environment. This is done to determine

and evaluate enemy capabilities, vulnerabilities, and probable courses of action.

Jamming -- The deliberate radiation, reradiation, or reflection of electromagnetic energy to prevent or degrade the receipt of information by a receiver. It includes communications jamming and noncommunications jamming.

MCS -- The Maneuver Control System (MCS) is the G-3 focal point for automation support in tactical operations.

OPSEC -- Operations Security is defined as; all measures taken to maintain security and achieve tactical surprise. It includes countersurveilance, physical security, signal security, and information security. It also involves the identification and elimination or control of indicators which can be exploited by the enemy.

SCP -- The Standard Command Post (SCP) effort started by the U.S. Army Combined Arms Center at Fort Leavenworth was an initiative that attempted to solve the command and control structure problems within the Army and develop a standard command post design. The Standardized Command Post program attempts to concentrate on the common battle focus roles of the cells within the command post and provide a realistic structure for future command posts.

SIGINT -- Signals Intelligence is the product resulting from the collection, evaluation, analysis, and interpretation of information derived from communications intelligence (COMINT) and electronic intelligence (ELINT).

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